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No. XV. OF VOL. I., 1933. LONDON, SATURDAY, APRIL 15, 1933 Pp. 120 — Price 1s.
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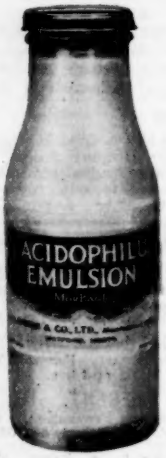

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ADDRESSES AND ORIGINAL ARTICLES

PHYSIOLOGY OF THE GALL-BLADDER AND ITS FUNCTIONAL ABNORMALITIES *

BY CHARLES NEWMAN, M.D. CAMB., F.R.C.P. LOND.

JUNIOR PHYSICIAN AND MORBID ANATOMIST, KING'S COLLEGE HOSPITAL; ASSISTANT PHYSICIAN TO THE BELGRAVE HOSPITAL FOR CHILDREN, LONDON

I.—PHYSIOLOGY

THE original duty of the Goulstonian lecturer was to dissect a body. In the course of evolution the subject of these lectures has changed to the consideration of a group of diseases, and I have taken for my task the large and still undeveloped question of the abnormalities of gall-bladder function. Undeveloped it is, because it is only in the last decade that we have any certain knowledge of these functions. Of course they were suspected long ago; every advance in medicine has been shrewdly suspected by someone with vision, in the past. Michael Foster, for instance, stated in 1895 that the gall-bladder emptied itself by muscular contraction under the influence of a nervous mechanism. But there is a difference between a suspicion, however just, and proof.

Concentration of Bile

Let us first consider the concentrating function of the gall-bladder. Since it was originally announced by Rous and McMaster [78] this function has been universally accepted. The facts they put forward were simple: 49·8 c.cm. of bile are concentrated by the gall-bladder in 22½ hours to 4·6 c.cm., and by simply allowing bile to flow through the gall-bladder it is concentrated from 2·3–4·8 times. This concentration is effected by the mucous membrane of the fundus and body, which is lined by a columnar epithelium, thrown into complicated minute folds. This region of the gall-bladder contains no glands. The concentration is facilitated by the very rich blood-supply from the cystic artery, and the large lymphatic spaces in the subserosa. In the infundibulum mucous glands appear, becoming more prominent in the neck, cystic duct, and bile-ducts. The gall-bladder can secrete 20 c.cm. of mucous fluid a day.[37]

With the exception of the gall-bladder, the extra-hepatic biliary system dilutes the bile with mucus, and does not concentrate it.[78 2] A slight degree of concentrating power has been attributed to the bile-ducts on the grounds that, after cholecystectomy, the bile which flows into the duodenum is more concentrated than liver bile. Blond [5] says that under the benign influence of Carlsbad salts the liver can secrete a 20-times-concentrated bile. It is equally possible that after cholecystectomy, or normally in those species which have no gall-bladder, the liver compensates by secreting a more concentrated bile. Boyden [8] points out that the rat, which has no gall-bladder, secretes a bile containing three times as much bilirubin as the mouse, which has one, and found in the bile of a cat whose gall-bladder was congenitally absent 2·2 times as much bilirubin as in the liver bile of normal cats.

The concentration of the bile is carried out mainly by absorption of water. At first the soluble salts, principally sodium chloride, are absorbed with the water at equal rates, but later the chloride is absorbed more rapidly, keeping the total osmotic concentration of the bile in the gall-bladder the same as that of liver bile and serum.[68 72 73] During the process of concentration the bile becomes more acid.[66 64 58 73] Liver bile has a pH of about 7 to 8·5, gall-bladder bile of about 5·5 to 7, a definite acidification.[66 74 81] This acidification of bile in the gall-bladder is of importance, because it is often stated in text-books (also [47 85]) that gall-stones are the result of acidification of bile. This is the opposite of the truth; indeed organised crystallisations resembling stones can be made by alkalinising bile.[63] It has on the other hand been suggested that one of the functions of the gall-bladder is to make the bile acid and so to prevent gall-stone formation.[79 58] Actually there is no striking difference in the pH of bile from stone-containing and normal gall-bladders.[74] Administration of acid or alkali by mouth does not affect the pH of bile in man.[67]

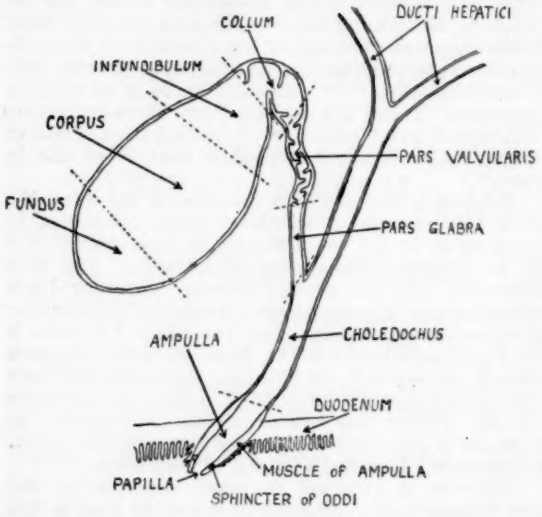
Calcium is excreted into the bile by the liver, the liver bile containing relatively large quantities, in doses up to 60 mg. per 100 c.cm. or even more.[30 59 73] It is concentrated in the gall-bladder, and also absorbed, but the greater removal of water leads principally to concentration. The normal gall-bladder does not secrete calcium into the bile [59 41]; there is only one experiment in the literature which suggests that it can do so.[21] In this case the cystic duct was obstructed, and we know that in that circumstance the gall-bladder does secrete calcium (vide infra). In man, liver bile contains 6·5–8·3 mg. per 100 c.cm., gall-bladder bile about 6–60 mg. or even more.[48 68 59]

Bilirubin is absorbed in small amounts by the gall-bladder wall; granules of it can be seen in the epithelium of the gall-bladder and upper cystic duct [2]; but of course the chief effects of gall-bladder activity is to concentrate it. Liver bile contains about 5·4 mg. per 100 c.cm. according to my own findings, 2·3–18 mg. according to Rosenthal and Zinner.[77] Gall-bladder bile from living patients contains from 80–137 mg., as opposed to 240–648 mg. in post-mortem bile.[77] My own figures on bile during life are lower, because of admixture with liver bile, as I shall show in my next lecture. The remarkable thing is that bilirubin is concentrated 5–40 times in the gall-bladder (about 20 times as a rule), whereas the other constituents are only concentrated 5–10 times. It is very improbable that the gall-bladder excretes bilirubin into the bile (in fact, so far as I know, this has never even been suggested), so that there must be a considerably greater absorption of the other substances than is found experimentally. This point much needs investigation.

Cholesterol and bile-salts must be considered together. The question of secretion of cholesterol by the gall-bladder has been one of the chronic controversies of medicine. The trouble began with Naunyn's contention that the cholesterol in gall-stones was secreted by the gall-bladder, and Aschoff's counter-denial. Since then a vast literature has mounted up, with which I am dealing elsewhere. The general conclusion to-day is that the normal gall-bladder does not secrete cholesterol (but see [24]). It is obvious that there is no significant secretion by the gall-bladder, because the factor of concentration of cholesterol in the gall-bladder is about midway between the factors for other substances. If any appreciable quantity were added, the factor would at least lie among those at the upper end of the series. In 24 hours a man (European) secretes approximately 0·4 g. of cholesterol and 5 g. of bile-salts.[27] The bile-salts hold the cholesterol in solution, as Wieland

* The Goulstonian lectures for 1933, delivered before the Royal College of Physicians of London on March 7th, 9th, and 14th. Lectures II. and III. will appear in forthcoming issues.

discovered,[92] by forming a water-soluble addition compound, not only in vitro, but also in human bile.[80] The normal gall-bladder absorbs this addition compound in small amounts. This is an active process on the part of the gall-bladder wall, not a simple diffusion. In a dialysing sac the bile-salts pass through, leaving the cholesterol behind.[1 80] It is possible that rather more bile-salt is absorbed than cholesterol in the normal gall-bladder,[76 75] but not in sufficient quantities to jeopardise the solubility of the cholesterol.[39] The pH and bile-salt contents of the



gall-bladder rise and fall together, so that the more acid the bile the less bile-salt it contains.[36] This is a buffering effect, and of no significance in the ætiology of gall-stones. There is general agreement now that cholesterol is not absorbed by the wall of the normal gall-bladder to any significant extent. I add this qualification because the question is always considered in relation to gall-stone formation, and minute experimental differences are not enough to form the basis for conclusions on so important a question. It is with cholesterol, as with calcium, a little futile to worry over trivial quantities from extraneous sources, when the bile itself contains such large amounts, quite sufficient to provide what is requisite.

Of the proteins, mucin is added to the bile in the gall-bladder by the secretion of the glands in its upper end. Albumin and globulin are not present in normal bile, nor secreted by the normal gall-bladder.

Fats, lecithin, and soaps are contributed by the liver and only concentrated in the gall-bladder.

To sum up: the gall-bladder concentrates the bile about ten times by the removal of water and soluble salts, the other soluble constituents being absorbed to some extent, but to a much greater degree concentrated. The mucous membrane of the normal gall-bladder and bile-ducts adds nothing to the bile but mucus. The bile-ducts dilute the bile by mucous secretion.

Structure and Function

The other function of the gall-bladder is its motor mechanism, by which it fills and empties. This concerns not only the gall-bladder, but the whole extrahepatic biliary system, which for practical purposes may be divided (see Figure) into the following parts: (1) the gall-bladder, which consists of the fundus (which usually lies free from the liver), the body, and the infundibulum. The infundibulum continues into (2) the neck and valvular cystic duct. The cystic duct continues, as (3) the pars glabra, to join the common bile-duct. The pars glabra, the common bile-duct, and the hepatic ducts form a single structure. After running in most cases through the pancreas, the common bile-duct perforates the wall of the duodenum obliquely and ends in the papilla of Vater, where the pancreatic duct joins it. This part of the duct is called (4) the ampulla.

These parts may be grouped into four main structures: (1) the fundus and body of the gall-bladder, the concentrating organ; (2) the infundibulum, neck, and valvular cystic duct, motor and secretory; (3) the hepatic, lower cystic, and common bile-ducts, passive tubes; and (4) the ampulla, motor in function.

The gall-bladder in man lies on the under surface of the liver, usually attached to it over a flat area, but sometimes free and mobile or embedded in the liver substance. It can hold about 50 c.cm. of liquid, and is relatively thin-walled. The smooth muscle in the wall is found mainly at the two ends. There is a good deal in the fundus, much less in the body. The fibres are arranged longitudinally and obliquely. There is much elastic tissue in the body, less in the more muscular fundus and infundibulum. The muscle in the infundibulum tends to a more circular arrangement, which persists into the neck and valvular parts of the cystic duct. There is morphological evidence that the neck region may act by peristalsis or as a sphincter, but this is at present uncertain, though probable. The cystic duct leads out of the gall-bladder at an angle (an arrangement which led to misconception, as I think, as to the causes of obstruction in that phase of medical thought when all functional disturbances were explained by "kinks and bands"). From the neck to halfway down the cystic duct the interior of the passage is thrown into folds, Heister's valves, which form a sort of irregular corkscrew. These folds contain some circular muscle-fibres. The lower or glabrous part of the cystic duct, together with the hepatic and common bile-ducts down to the ampulla, are similar in structure, in that they are simply fibro-elastic tubes, with very little muscle.[33 2 4 65 96] I have never been able to make out any complete rings of muscle-fibres, a point with which the authorities agree. In the ampulla smooth muscle reappears—in fact, the muscle coat is thicker here than anywhere else in the extrahepatic biliary system. The fibres in the upper half inch or intramural part are mostly oblique and longitudinal [33 65] with a circular ring of muscle surrounding the duct, in the tip of the papilla. The muscular end of the common bile-duct, then, consists of two structures: the long, oblique-fibred ampulla, and the small terminal ring in the tip of the papilla. In most papers on the subject, the whole structure is called "the sphincter of Oddi." I use the name only for the terminal sphincter. It has been said that the muscular wall of the gall-bladder resembles in its general arrangement the urinary bladder, with one important difference; it is not nearly so strong. The wall of the ampulla is very like the ejaculatory muscle coat round the urethra.[65] The anatomy suggests that the extrahepatic biliary system has a motor function, but the thinness of the gall-bladder wall prevents any certain conclusions being drawn; indeed, it has often been used as an argument against it.

Filling of the Gall-bladder

No one questions that the bile enters the gall-bladder by flowing up the cystic duct. There is, however, one very important condition, and that is that the sphincter of Oddi must be closed.[90 91] The existence of this sphincter both as an anatomical

and as a physiological structure has been much discussed. It has been described many times,[26] and of its anatomical existence there can be no question. It is the small ring of muscle bundles, separate from the duodenal muscle, in the tip of the papilla. Its physiological action has been denied mainly as the result of finding that its removal in no way affected the emptying of the gall-bladder, an argument which might disprove an obtrusor mechanism, but cannot disprove a sphincter action. Its physiological existence has been demonstrated conclusively by Lueth,[49] who by means of an ingenious apparatus measured the pressure gradient in the intramural part of the common bile-duct and found positive evidence of a sphincter action. Moreover, he found that the ampulla could be distended with perfusion fluid, proving that the terminal part of the bile-duct must be able to hold up fluid at pressure. This confirmed the previous results of McMaster and Elman,[53] who had measured the pressure in different parts of the extrahepatic biliary system by triple intubation. The sphincter action is not produced by the tone of the duodenal wall.[42 49] In dogs, the sphincter can hold up bile in the common bile-duct at a pressure of about 100 mm. of water,[15 23] and, with the ampulla, even at a pressure of 600–675 mm.[42 54 18] After cutting the sphincter the pressure in the common bile-duct falls to zero and the gall-bladder does not fill.[90] The tone of the sphincter of Oddi varies greatly. It increases with fasting[23] or with distension of, or pressure of alkali in, the stomach, and falls with feeding and with acidity of gastric contents,[15 23] and with the presence of magnesium sulphate in the stomach.[18 71] Its nervous control will be dealt with later.

The liver secretes a thin watery bile continuously, at a pressure which can rise to about 300 to 360 mm. of water,[42 53] only one-half to one-third of the secretion pressure of urine[52] being derived from portal venous, not arterial pressure. If the pressure rises above this liver secretion ceases. With the sphincter of Oddi contracted the bile-ducts fill, and when the pressure rises sufficiently bile pours into the gall-bladder. In the gall-bladder the bile is concentrated, and when the pressure in the gall-bladder falls below that in the bile-ducts more bile runs in, and so on during the fasting period. When the gall-bladder is full of concentrated bile and can hold no more it is physiologically removed, as it were, and the sphincter relaxes and lets off liver bile into the duodenum. This explains the presence of bile-stained fluid in the duodenum in a fasting patient; whereas the duodenal fluid is bile-free two or three hours after a meal. With regular meals the gall-bladder can hold all the bile secreted. The liver produces 500–1300 c.cm. of bile in 24 hours, and this, concentrated ten times, will fill the gall-bladder one to three times. (Calculated from cholesterol content. The 20 c.cm. of mucus contribute the rest of the gall-bladder contents.) The gall-bladder fills, then, during the fasting period by the interaction of the liver secretion pressure and the tone of the sphincter of Oddi.

Mechanism of Emptying

The emptying of the gall-bladder is a more controversial subject. It has been seriously maintained[19 86 5 31] that no bile which enters the gall-bladder ever leaves it by the cystic duct, but that it is completely reabsorbed as being a "valuable secretion" (this theory ignores the fact that bile is also an excretion). That the gall-bladder bile is absorbed in toto has been disproved by comparing the absorption of bile and sodium iodide.[35] The contention that the valves of Heister are specially designed to prevent bile from escaping down the cystic duct has been disproved by Johnston and Brown,[40] who found no resistance to flow in either direction at pressures such as are normally found in the bile tract, and that the slight impediment at very low pressures was overcome by a pressure of 10–80 mm. water, which is much lower than that which the gall-bladder can produce. Keith[45] suggested, indeed, that the function of Heister's valve was to keep the cystic duct open.

There are various proofs that the gall-bladder empties, via the cystic duct, into the duodenum:—

(1) It has been seen to contract in human beings during laparotomy, in response to fats injected by tube into the duodenum, and at the same time B. bile was recovered through the tube.[70 26]

(2) During cholecystography on man, after the fatty meal, the gall-bladder can be seen to diminish in size, and the bile-ducts have been seen to fill up with the opaque bile which was previously in the gall-bladder.[11]

(3) In animals, iodised oil injected into the gall-bladder has been seen to pass down the bile-ducts into the duodenum.[90] (The concentration of dye during cholecystography is not usually great enough to make it visible in the duodenum.)

I must apologise for stressing these facts, but the emptying of the gall-bladder has so often been denied that unless there is absolute certainty on this point it is useless to discuss the mechanism or the abnormalities of this process.

The physiological stimulus for the expulsion of bile is the passage of food into the duodenum or even into the jejunum—as, for instance, after gastro-enterostomy.[83 43] A small psychic flow has been noted as a result of seeing and smelling food in man[6] and dogs.[46 53 71] There is an optimal zone for the effect of food—namely, the descending part of the duodenum, in the region of the papilla.[26] Of the foods, yolk of egg, fats, including cream and milk and the vegetable oils, are the most effective.[90 91 11] The flow starts almost as soon as the food enters the duodenum.[7] Other substances which empty the gall-bladder when taken by mouth are Witte's peptone[46 84 9 70 60] and magnesium sulphate.[51 10 26 60] The gall-bladder also empties after hypodermic injection of pituitrin,[18 44 60] histamine,[12] and the preparation known as Cholecystokinin (vide infra).

Under the influence of any of these stimuli the gall-bladder first pulls itself together, as it were, and instead of hanging flaccid like a pear, rises, stiffens, and becomes oval in shape.[11] Then the fundus contracts, changing the shape to that of a pear with the thicker end uppermost, or the whole bladder contracts uniformly. Contraction rings[34 87] and other visible changes in surface have been seen. During this phase the pressure in the gall-bladder rises to about 230 mm. of bile.[53 39 18] Accompanying the gall-bladder contraction there is a lowering of the resistance to the flow of bile through the papilla.[23 53] At the papilla, bile is seen in animals to emerge in spurts and little gushes,[28 71] a phenomenon exactly reproduced by the flow of bile from a duodenal tube in man. The expulsion of bile is sometimes associated with a wave of duodenal peristalsis, but often takes place between peristaltic waves.[28 49 71] There is no doubt that the muscle of the ampulla can work quite independently of the duodenal wall. The application of the "law of the intestine" to the evacuation of the gall-bladder suggested to Meltzer that the gall-bladder and sphincter were reciprocally innervated,[57] and other workers have confirmed this conclusion experimentally.[53 89] There has been much disagreement about this, but it must be remembered that cholecystokinin can empty the gall-bladder via the blood stream, and that denervation experiments

therefore only confirm this effect, without disproving the possibility of a double mechanism. My own experience on human beings, and the simple probability of the theory, incline me strongly to believe in reciprocal innervation. The experiments advanced against this theory are all open to criticism. Failure to see reduction in size during cholecystography is not sufficient evidence that bile is not flowing into the duodenum; the gall-bladder mechanism does not work under deep anæsthesia; in experiments with highly opaque iodised oil injected into the gall-bladder, care must be taken that it is not too viscid to be able to flow along the cystic duct; catheterisation of the ampulla only proves that the gall-bladder can empty itself through an open tube, not that there is no relation between the gall-bladder and the ampulla under normal circumstances.

If the papilla is catheterised in this way the gall-bladder empties, and it has therefore been claimed that the gall-bladder is alone responsible.[34 25 32] On the other hand, the activity of the ampulla and duodenum has been found to be sufficient to expel bile, and consequently the gall-bladder has been presumed to be inactive.[17 13 18] It is certainly true that the sphincter can hold up a pressure greater than that which the gall-bladder can produce, but so long as bile is "fed" to the ampulla continuously the ampulla is perfectly capable of providing the motive force necessary to expel bile into the duodenum. On the other hand, if the common bile-duct and ampulla are converted into a permanently open channel to minimise the work of the gall-bladder, the gall-bladder alone can cause a flow of bile. The conditions, however, are not normal. It is to be noted that the gall-bladder does not empty solely by virtue of its elastica, but by muscular contraction; it does not empty if the common bile-duct is cut and left open in the peritoneum, unless stimulated by a meal.[7] When it is over-distended it does empty partially by elastic recoil.[91] Bile is not expelled by milking or sucking movements of the duodenal wall, as has been shown by damaging the gall-bladder by clamps and finding that movements of the duodenum caused no flow.[7] Neither is the gall-bladder emptied by respiratory or other voluntary muscular movements. It may seem rather supererogatory to say so, but it is a matter of common knowledge that it is absolutely impossible to transfer fluid from one half-filled rubber sac to another connected with it by a tube, if the two are in the same pressure cavity, by any alterations in common pressure whatever. For all this the gall-bladder has been supposed to empty in this way from time immemorial. The fallacy has arisen (apart from mere loose thinking) as a result of experiments in which the common bile-duct has been opened to the exterior. Then, of course, respiration, vomiting, &c., will have a profound effect. But even then if the sphincter is transplanted into the abdominal wall and the animal allowed to recover, the effect of respiratory movements only lasts a short time.[71] Many workers have been to the trouble of proving that respiratory movements, &c., have no effect ([53 7 16] and others); the neatest proof being that of Higgins and Mann,[34] who worked on fishes, which have no respiratory movements and whose gall-bladders empty perfectly well after a fat meal.

Expulsion of Bile in the Absence of a Gall-bladder

In relation to the problem of bile-expulsion it is of interest to consider what happens after cholecystectomy and in those animals which have no gall-bladder.

After cholecystectomy the extrahepatic bile-ducts dilate. Not to the same extent as in malignant obstruction, but to a size definitely larger than normal. The intrahepatic ducts, however, are unaffected, in contradistinction to the intrahepatic dilatation of malignant obstruction. In malignant obstruction the "white bile" comes from the mucous glands, which secrete at a much higher pressure than the liver. This dilatation after cholecystectomy is dependent on the sphincter of Oddi. If this is destroyed, no dilatation takes place.[42] At the same time the remains of the cystic duct dilate as if in an attempt to form a substitute gall-bladder.[22] The flow of bile is entirely altered in character after cholecystectomy. Instead of emerging in spurts, it dribbles away continuously, a sort of retention with overflow.[71]

In man, unless the sphincter is over-strong, exactly the same thing happens. Mann [54] has suggested that after cholecystectomy the sphincter dilates with the rest of the common bile-duct and becomes incontinent. The pressure in the bile-ducts, experimentally, falls to 30–60 mm., whereas in control animals it was 160–170 mm.[42] It may even fall to zero.

It is natural to expect that light will be thrown on the function of the gall-bladder as a reservoir by consideration of those animals which have no gall-bladder. It is very strange that the horse, rat, three-toed sloth, and pocket gopher have no gall-bladder, whereas such closely related species as the cow, mouse, two-toed sloth, and thirty-two striped gopher have one. The pigeon alone among birds has no gall-bladder, but only because it loses it during fœtal life.[8] In those animals which have no gall-bladder the outflow of bile is a continuous trickle,[28] as in man and the dog after cholecystectomy. There is a sphincter at the end of the common bile-duct irrespective of whether there is a gall-bladder or not,[55] but it looks more like interlaced fibres of the duodenal wall in those animals which have no gall-bladder and less like a special structure. Presence or absence of the gall-bladder makes no difference to the direction of the common bile-duct through the duodenal wall,[55] and there is no difference between the capacities of the bile-ducts in the two groups.[56] Thanks to the Zoological Society of London, and the personal kindness of Colonel A. E. Hammerton, the prosector at the Zoo, I am being privileged to investigate the comparative anatomy of the extrahepatic biliary system, and I would like to tender my thanks to them. The significance of this absence of the gall-bladder is very obscure. It is not simply that herbivores have no gall-bladder, whereas carnivores have,[66] although this is partly true. Nor can it be that the difference depends on continuous or intermittent feeding, though this again is partly true; compare, for instance, the horse, which eats nearly all the time (as anyone who has been out in the fields at night knows), and the cow, which spends a large part of the day chewing the cud. But the fact that we do not yet know what it means, does not imply that it means nothing, and that a patient is necessarily just as well off enjoying the zoological status of a horse, without a gall-bladder, as he was as a man with one.

Nervous and Pharmacological Stimuli

Before leaving the motor mechanism of the extrahepatic bile system, we must consider the effect of nervous and pharmacological stimulation. The gall-bladder, sphincter, and ampulla are supplied with nerves from the vagus (principally left) and the splanchnic sympathetic. Much contradictory evidence has been produced about the effect of nervous stimulation. It was found by Bainbridge and Dale in 1905 [3] that stimulation of the sympathetic relaxed

the gall-bladder and that cutting the sympathetic increased the slight rhythmic contractions which appear two or three times a minute in the resting gall-bladder (the so-called "tonus rhythm").[12 50] With this inhibitor effect of the sympathetic all writers agree who have found any effect at all. Stimulation of the vagus has been found to have different effects, and it was not until Westphal [38 39] related the strength of the stimulus (electrical and pharmacological) with its effect that the discrepancies were cleared up. He showed that slight vagus stimulation was motor to the gall-bladder, relaxed the sphincter of Oddi, and caused peristalsis in the ampulla, while strong stimulation caused spasm of the ampulla and so prevented bile flow. Bainbridge and Dale had in 1905 said that the vagus, especially the left, was the motor nerve to the gall-bladder. Pharmacologically, atropine relaxes the gall-bladder by paralysing the vagus, histamine, acetyl choline, morphine, ergotamine, and pilocarpine contract it.[34 32 44 39 50 40] The effect of nervous stimulation, whether electrically or by drugs, can be summed up in the findings of Westphal (with which, at any rate as regards man, I agree on my own experience) as follows: light vagus stimulation contracts the gall-bladder, relaxes the sphincter of Oddi, and causes peristalsis of the ampulla and a flow of bile; strong stimulation causes spasm in both gall-bladder and ampulla and cessation of flow; sympathetic stimulation causes relaxation of the gall-bladder and ampulla, and contraction of the sphincter of Oddi. This seems to me to contribute to the evidence for the reciprocal innervation of the extrahepatic biliary system.

The nervous mechanism seems to be supplemented, as so often happens with smooth muscle, by a humoral mechanism. The humoral substance is cholecystokinin,[39 37] a substance of unknown composition, related to secretin and produced by the action of acid on the mucosa of the duodenum and jejunum.[38] Possibly a very little can be produced in the stomach.[61] Undigested egg-yolk and olive oil apparently produce no cholecystokinin, even according to Ivy and his co-workers who discovered it.[39] The cholecystokinin mechanism seems fairly certain, although it has not yet been repeated outside its place of origin, as crossed-circulation experts have proved beyond doubt that no nervous factor can be involved, and very careful experiments have excluded the possibility of respiratory or other muscular movements, choline or vasodilator substances being responsible.[50] Moreover the gall-bladder has been seen to contract, and its contractions photographed after injection of cholecystokinin.[50 57] The work so far has all been done on animals. To sum up, the bile is evacuated by a contraction of the gall-bladder, which fills, and keeps filled, the elastic bile-ducts, and the ampulla squirts the bile fed to it out into the duodenum.

Before whole-heartedly accepting cholecystokinin, there are two points which need explanation: (1) the injection of olive oil down a duodenal tube causes a flow of bile, although it is said not to liberate cholecystokinin; and (2) the duodenal contents are often acid, sometimes highly so, and yet no bile is flowing. In the first place the biliary mechanism seems to be working at the bidding of some other stimulus, and in the second cholecystokinin ought theoretically to be being liberated and yet nothing is happening. It is also to be noted that Morgan, Crandall, and Ivy, although believing that hydrochloric acid in the duodenum is the effective stimulus for cholecystokinin production, found that in total duodenal achlorhydria, experimentally, the gall-bladder emptied normally.[62]

Investigation of the Gall-bladder Function in Man

There are two special methods: cholecystography and duodenal intubation.

Cholecystography is of the greatest use in the diagnosis of organic disease of the gall-bladder and of gall-stones, but it has two disadvantages in the diagnosis of functional disorders. Firstly, that it tells us little about the concentrating activity. It is true that the intensity of the shadow depends on the degree of concentration of the bile, but a cholecystogram can only tell us that the gall-bladder concentrates well in general terms. If the shadow is indefinite, it may be because the concentration is defective, or it may be that too little bile has entered the gall-bladder. It provides no possibility of any chemical study. Secondly, it only tells us very roughly how the gall-bladder empties. After giving three egg-yolks, the gall-bladder shadow should start to decrease in 10–20 minutes, and it should be half empty in 35 minutes. After an hour and a half it should be only 1/20th of its original size.[11] Only gross disorders are at present diagnosed. Bronner in Germany has used cholecystography as a means of diagnosing disorders of motility, but it is very difficult to obtain certain information. For one thing, it is not only the rate at which the gall-bladder empties which matters; the type of emptying process is also significant, and on this point X rays give no information. Moreover, the size of the gall-bladder varies so greatly in individuals, that a distension which falls within the limits of normal for the species may be grossly abnormal for the individual. Cholecystography has also the disadvantage that the intravenous injection of the dye is not without danger, and that unless it is injected a negative result may only be due to defective absorption. At present I use cholecystography for the help it gives in excluding and diagnosing gross organic disease. It seems likely that refinements of interpretation will, in the future, increase its value in the diagnosis of motility disorders.

Duodenal intubation has great advantages. It gives information as to the manner in which the bile is expelled, it makes it possible to test the effect of drugs on the process, it provides the bile itself for analysis, and a negative result is not, with proper technique, meaningless. It has two disadvantages: that it is at least as unpleasant to the patient as cholecystography, and that it is apt to give the physician a great deal of trouble and waste a great deal of time. For this reason I would not recommend duodenal intubation to anyone but an enthusiast. Like many other technical processes, it seems to require a quite indefinable skill which comes only with experience (until the fourth case my own attempts were extremely unsuccessful), and one must be prepared for an occasional complete and exasperating failure. Much has been written on the technique and uses of duodenal intubation, but that does not concern the subject of these lectures. The only thing I must do is to describe my own technique; not because it is a good one (it is not, and is in process of complete reform), but because results are only results of a given technique, and up to the writing of these lectures I have adopted and adhered to a rigid routine.

The patient is given a cup of tea without milk and a piece of dry toast at 6 A.M., to keep body and soul together, and nothing more. Theoretically, he should be completely starved, but this is more scientific than humane. Before starting, it is essential to estimate the length of tube required to reach the bottom of the stomach and the papilla of Vater. These lengths may be estimated in two ways: Firstly, the "bucket" is placed on the abdomen in the position of the

papilla of Vater, and the tube layed out, following its internal course, up to the teeth, and the point on the tube noted, repeating the measurement from the umbilicus to the teeth for the stomach. The alternative method is to measure the distance from the Adam's apple to the sterno-xiphisternal junction (this, doubled, gives the distance from the teeth to the bottom of the stomach and is referred to as "the mark A"). The distance from the sterno-xiphisternal junction to the anterior superior iliac spine, added to the above measurement, gives the distance to the papilla for that particular patient and is referred to as "the mark B."[14] The ring marks on the tube are only the "normal" distances, and patients often do not conform to this Procrustean standard, but the first ring mark may be taken as indicating the position of the cardiac orifice of the stomach.

At 10 A.M. the patient swallows a thin tube with an ordinary gastric metal bucket (I prefer this to the Einhorn type, because the weight of the larger metal bucket is very useful). The gastric juice is aspirated with a syringe when the tube has reached the mark "A" and the patient is rolled first to one side and then to the other to ensure complete removal of the stomach contents. This gastric residue is kept, and the free and total acid estimated. The stomach is then washed out thoroughly with repeated washings of hot water until clean. At this stage I usually make a note of the intragastric pressure with a water manometer. The tube is then drawn back to the one ring mark, and the patient rolled well over on to the right side, with the shoulder below the bolster, and the head on one pillow. The other pillow is tucked behind the back for comfort. In this position the tube is swallowed gradually, one centimetre a minute, until the mark "B" reaches the teeth. This manœuvre of withdrawing the tube to the cardiac orifice of the stomach and starting again for the duodenum is very important. It ensures that the tube shall travel down the "pathway of the stomach" and not lose itself by coiling up in the stomach cavity. It also prevents the tube tying itself into a knot, an accident which happened once and caused great difficulty in removing it at the end of the proceedings.

The next point is to be sure that the end of the tube is in the duodenum. Unless this is absolutely certain, all negative results are useless. It is the one essential of the whole procedure. The only certain proof is by seeing the metal bucket in the correct position by X rays. Until I was used to the behaviour of the duodenum as interpreted by a tube, I always used the X ray screen to verify the position of the tube; I still do if there is any doubt. The presence of bile in the fluid withdrawn is no indication, as the stomach may contain bile and the duodenum may not. The duodenal contents are frequently acid, and the stomach contents may be neutral, so that the reaction is unreliable. The points which I have found of value are these: (1) The stomach contents are either watery or of the consistency of over-boiled tapioca, that is extremely viscid and one might almost say "tough." The duodenal contents are usually of the consistency of glycerin and water. (2) When 10 c.cm. of water are injected through the tube, 8–12 c.cm. are recoverable by reaspiration with the syringe so long as the bucket is in the stomach, if the tube is in the duodenum only 3–4 c.cm. can be recovered. (3) When the metal bucket is in the duodenum, attempted aspiration with the syringe produces a sensation exactly as if the patient was biting the tube. (4) When the tube is in the duodenum the fluctuations of pressure with respiration transmitted to a manometer are only a tenth to a half (at most) of what they were in the stomach. I have never encountered a positive pressure in the duodenum in normal people, nor ever observed a peristaltic wave on the manometer. These are the tests upon which I have found one can rely, although many other tests have been described.

From this stage it is better to use siphonage than the syringe for withdrawing the visceral contents. It simplifies matters to attach the end of the duodenal tube to one outlet of a three-way glass tap, to the other outlets of which are attached respectively a glass manometer tube about 18 in. long and a short length of rubber tubing into which the nozzle of the 20 c.cm. syringe fits with ease. The gastric part of the procedure can then be done with the syringe; turning over to the manometer tube, hanging downwards as a siphon drain, when the tube is in the duodenum, and allowing the fluid to run into a series of test-tubes. Allowances must be made for the length of the tube-system in associating gushes of flow at the distal end with the actual fluid which has flowed into the duodenum. In normal people the duodenal fluid contains a trace of bilirubin (0·5 to 1·0 mg. per 100 c.cm.), the gall-bladder being full a little leakage of liver bile is taking place through the sphincter of Oddi.

To excite a flow of bile from the gall-bladder there is a choice of stimulants. I used magnesium sulphate at first, but found it very inefficient. It is said sometimes to cause peristalsis and regurgitation of the tube into the stomach.[20] It is also a little unkind to administer a violent purge to people whose bowels are perfectly active. Egg-yolk I did not use because it emulsifies with the bile and makes microscopy and cholesterol estimations impossible. Peptone has the disadvantage that it renders estimation of the bile-acids impossible by the amino-nitrogen method, and at the time I hoped to do this. Pituitrin would be ideal, but the dose used in Germany is 2 c.cm. of the Parke Davis preparation, and having had 1 c.cm. injected into myself on occasion for experimental purposes, and retaining a vivid memory of the sensations it produced, I did not feel justified in using it on patients, nor did it seem safe to give 2 c.cm. to middle-aged persons, whose blood pressures and arteries are often abnormal. So I decided on olive oil, which floats on the bile and does not dilute it to an unknown extent, as watery solutions do. It is a tolerably good stimulant for bile-evacuation. The soaps it forms are easily recognisable under the microscope (they look like ears or bits of saucers heated till they had started to crinkle at the edges) and therefore do not confuse the microscopical picture. Twenty cubic centimetres of olive oil, heated by standing in hot water till it is really hot (about the temperature at which women drink tea) are injected by the tube. All liquids so administered should be at this temperature; the biliary system is paralysed at once by the insult of cold fluids. A few minutes after the exhibition of the oil bile begins to flow, in spurts, at first light coloured (the "A," or bile-duct bile), then suddenly becoming much darker (the "B," or gall-bladder bile). During this phase, if necessary, gr. 1/40 of pilocarpine is injected intravenously to observe the effect of vagal stimulation. The "B" bile flows for about 10–15 minutes, it then becomes lighter in colour ("C," or hepatic bile). Twenty cubic centimetres of oil do not empty the gall-bladder, which seems to be very nicely adjusted to deliver just the right amount. When the investigation is over, the tube is washed out by injecting 20 c.cm. of hot water so that it will not taste bitter, and the patient allowed to pull it up; there is then no danger of pain being inflicted by thoughtless pulling while peristalsis of the œsophagus is gripping the bucket.

REFERENCES

1. Andrews, E., Schönheimer, S., and Hrdina, L.: Proc. Soc. Exp. Biol. and Med., 1931, xxviii., 945.
2. Aschoff, L.: Arch. f. klin. Chir., 1923, cxxvi., 233.
3. Bainbridge, F. A., and Dale, H. H.: Jour. of Physiol., 1905, xxxiii., 138.
4. Berg, B. N.: Surg., Gyn., and Obst., 1928, xlvi., 464.
5. Bland, K.: Klin. Woch., 1927, vi., 1606.
6. Boyden, E. A.: Proc. Soc. Exp. Biol. and Med., 1927, xxv., 99.
7. Boyden, E. A.: Surg., Gyn., and Obst., 1928, xlvi., 30.
8. ,, ,, : Proc. Soc. Exp. Biol. and Med., 1929–30, xxvii., 86.
9. Brinkman, Dr., and Hage, Dr.: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1923, xxxvii., 263.
10. Bronner, H.: Ibid., p. 641.
11. ,, ,, : Fort. a. d. Geb. d. Röntgenstr., 1929, xxxix., 23.
12. Brugsh, T., and Horsters, H.: Arch. f. exp. Path., 1926, cxviii., 264.
13. Burget, C. E., and Brocklehurst, R. J.: Amer. Jour. Physiol., 1928, lxxxiii., 578.
14. Cintra do Prado, F., and Machado, J. C.: Deut. med. Woch., 1931, lvii., 1625.
15. Cole, W. H.: Amer. Jour. Physiol., 1925, lxxii., 39.
16. Copher, G. H., and Illingworth, C. F. W.: Surg., Gyn., and Obst., 1928, xlvi., 459.
17. Copher, G. H., Kodama, S., and Graham, E. A.: Jour. Exp. Med., 1926, xliv., 65.
18. Crain, R. C., and Walsh, E. L.: Surg., Gyn., and Obst., 1931, liii., 753.
19. Demel, R., and Brummelkamp, R.: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1923–24, xxxvii., 515.
20. Desmarest, E.: Jour. de Méd. et de Chir. Prat., 1931, cii., 693.
21. Dostal, L. E., Hrdina, L., and Goff, M.: Proc. Soc. Exp. Biol. and Med., 1931–32, xxix., 541.
22. Eisendrath, D. N., and Dunlavy, A. C.: Surg., Gyn., and Obst., 1918, xxvi., 110.

23. Elman, R., and McMaster, P. D.: Jour. Exp. Med., 1926, xliv., 151.
24. Elman, R., and Taussig, J. B.: Ibid., 1931, liv., 775.
25. Emerson, W. C., and Whitaker, L. R.: Amer. Jour. Physiol., 1928, lxxxiii., 484.
26. Friedrich, L. von: Arch. f. Verdauungskrank., 1931, l., 319.
27. Fox, F. W.: Quart. Jour. Med., 1927–28, xxi., 107.
28. Giordano, A. S., and Mann, F. C.: Arch. Path. and Lab. Med., 1927, iv., 943.
29. Goff, M., Hrdina, L., and Andrewes, E.: Proc. Soc. Exp. Biol. and Med., 1931–32, xxix., 549.
30. Guassardo, G.: Pathologica, 1929, xxi., 180.
31. Halpert, B.: Arch. of Surg., 1929, xix., 1037.
32. Hamrick R. A.: Amer. Jour. Med. Sci., 1929, clxxiv., 168.
33. Hendrickson, W. F.: Bull. Johns Hopkins Hosp., 1898, ix., 221.
34. Higgins, G. M., and Mann, F. C.: Amer. Jour. Physiol., 1926, lxxviii., 339.
35. Hunt, E. A., and Boyden, E. A.: Proc. Soc. Exp. Biol. and Med., 1929–30, xxvii., 645.
36. Itoo, T.: Arb. a. d. med. Univ. Okayama, 1930, ii., 103.
37. Ivy, A. C.: Proc. Interstate Post-grad. Med. Assemb. of N. Amer., 1929, v., 378.
38. Ivy, A. C., Kloster, G., Lueth, H. C., and Drewer, G. E.: Amer. Jour. Physiol., 1929–30, xci., 336.
39. Ivy, A. C., and Oldberg, E.: Ibid., 1928, lxxxvi., 599.
40. Johnston, C. G., and Brown, C. E.: Surg., Gyn., and Obst., 1932, liv., 477.
41. Johnston, C. G., Ravdin, I. S., Austin, J. H., and Morrison, J. C.: Amer. Jour. Physiol., 1931–32, xcix., 648.
42. Judd, E. S., and Mann, F. C.: Surg., Gyn., and Obst., 1917, xxiv., 437.
43. Kalk, H., and Nissen, K.: Deut. med. Woch., 1931, lvii., 1232.
44. Kalk, H., and Schöndube, W.: Zeit. f. ges. exp. Med., 1926–27, liii., 461.
45. Keith, A.: THE LANCET, 1903, i., 631.
46. Klee, P., and Küpfel, O.: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1914, xxvii., 785.
47. Kramer, S. P.: Jour. Exp. Med., 1907, ix., 319.
48. Lichtwitz, L., and Bock, Fr.: Deut. med. Woch., 1915, xli., 1215.
49. Lueth, H. C.: Amer. Jour. Physiol., 1931–32, xcix., 237.
50. Lueth, H. C., Ivy, A. C., and Kloster, G.: Ibid., 1929–30, xci., 329.
51. Lyon, B. B. Vincent: Jour. Amer. Med. Assoc., 1919, lxxiii., 980.
52. McMaster, P. D., Rous, P., and Brown, G. O.: Jour. Exp. Med., 1923, xxxvii., 685.
53. McMaster, P. D., and Elman, R.: Ibid., 1926, xliv., 173.
54. Mann, F. C.: Jour. Lab. and Clin. Med., 1920, v., 107.
55. ,, ,, ,, Anat. Record, 1920, xviii., 355.
56. Mann, F. C., Brimhall, S. D., and Foster, J. P.: Ibid., 1920, xviii., 47.
57. Meltzer, S. J.: Amer. Jour. Med. Sci., 1917, cliii., 469.
58. Mentzer, S. A.: Arch. of Surg., 1927, xiv., 14.
59. Mirvish, L., Sacks, S., and Schrire, T.: Jour. of Physiol., 1930, lxx., 434.
60. Mobitz, W.: Zeits. f. ärtz. Fortbild., 1932, xxix., 72.
61. Morgan, J. E., Crandall, L. A., and Ivy, A. C.: Proc. Soc. Exp. Biol. and Med., 1931–32, xxix., 227.
62. Morgan, J. E., Crandall, L. A., and Ivy, A. C.: Ibid., p. 228.
63. Newman, C.: Beit. z. path. Anat., 1931, lxxxvi., 187.
64. Neilson, N. M., and Meyer, K. F.: Jour. Infect. Dis., 1921, xxviii., 510.
65. Nuboer, J. F.: Frankf. Zeit. f. Path., 1931, xli., 198 and 454.
66. Okada, S.: Jour. of Physiol., 1913–16, l., 114.
67. Ottenberg, R., and Kahn, J.: Proc. Soc. Exp. Biol. and Med., 1931–32, xxix., 573.
68. Peel, A. A. F.: Zeits. f. physiol. Chem., 1927, clxvii., 250.
69. Pfuhl, W.: Möllendorff's Handb. d. mik. Anat. d. Mensch., Berlin, 1932, vol. v., No. 2, p. 436.
70. Pribram, E. E.: Arch. f. Gynäk., 1923, cxix., 57.
71. Palstow, C. B.: Arch. of Surg., 1931, xxiii., 1013; and Coll. Papers Mayo Clin., 1931, xxiii., 134.
72. Ravdin, I. S., Johnston, C. G., Austin, S. H., and Riegel, C.: Amer. Jour. Physiol., 1931–32, xcix., 638.
73. Ravdin, I. S., Johnston, C. G., Riegel, C., and Wright, S. L.: Ibid., 1932, c., 317.
74. Reinhold, J. G., and Ferguson, L. K.: Jour. Exp. Med., 1929, xlix., 681.
75. Riegel, C., Ravdin, I. S., and Johnston, C. G.: Amer. Jour. Physiol., 1931–32, xcix., 656.
76. Rosenthal, F., and Licht, H.: Klin. Woch., 1928, vii., 1592.
77. Rosenthal, F., and Zinner, K.: Zeits. f. ges. exp. Med., 1931, lxxviii., 498.
78. Rous, P., and McMaster, P. D.: Jour. Exp. Med., 1921, xxxiv., 47.
79. Rous, P., McMaster, P. D., and Drury, D. R.: Ibid., 1924, xxxix., 77.
80. Schönheimer, R., and Hrdina, L.: Proc. Soc. Exp. Biol. and Med., 1931, xxviii., 944.
81. Schultz-Brauns, O.: Verhand. d. deut. path. Gesellsch., 24th session, 1929, p. 337.
82. Singer, G.: Die Gallensteinkrankheit, Berlin, 1925.
83. Sosman, M. C., Whitaker, L. R., and Edson, P. J.: Amer. Jour. Roentgenol., 1925, xiv., 495.
84. Stepp, W.: Zeits. f. klin. Med., 1920, lxxxix., 313.
85. Stern, R.: Med. Klin., 1928, xxiv., 444.
86. Sweet, J. E.: Internat. Clin., 1924, i., 187.
87. Walsh, E. C.: Amer. Jour. Physiol., 1931, c., 594.
88. Westphal, K.: Zeits. f. klin. Med., 1923, xcvi., 52.
89. Westphal, K., Gleichmann, F., and Mann, W.: Gallenwegsfunktion und Gallensteinleiden, Berlin, 1931.
90. Whitaker, L. R.: Amer. Jour. Physiol., 1926, lxxviii., 411.
91. Whitaker, L. R.: Jour. Amer. Med. Assoc., 1927, lxxxvi., 1542.
92. Wieland, H., and Sorge, H.: Zeits. f. physiol. Chem., 1916, xcvii., 1.

THE REACTIONS WITH ALUM-TOXOID IN DIPHTHERIA PROPHYLAXIS

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THIS paper deals with 579 cases in which alum-toxoid was used as the antigen. The number is larger than that referred to in a recent communication,[1] in which 436 cases were analysed. The difference is comprised of: (*a*) children who had not attended for Schick-testing after treatment; (*b*) new cases; and (*c*) a few new cases who were treated with new batches of alum-toxoid. Reference [2] has been made to the nature of the reactions and the tendency to indurations and the formation of abscesses in connexion with the use of this antigen.

Since alum-toxoid has proved in my hands a very reliable antigen, of quick action and high potency, it appears to be worth a more extended trial, and its drawbacks should be understood as fully as possible. The following notes are based on an examination of all the records which are at our disposal in connexion with these cases. The frequency of reactions or other ill-effects bears a definite relationship to the batch under review and to the composition of the batch concerned. It seems desirable, therefore, to reproduce the table of relative compositions of the various batches for purposes of reference.

TABLE I.—*Relative Composition of Batches of Alum-toxoid*

Batch.	Dilution of toxoid.	Percentage of alum.	Lf. value.
B6219	1 in 10	0·5	under 1
B6217	1 in 10	2·0	1·5
B6539	1 in 1	7·5	11·0
B6707	1 in 1	9·0	15·0

Reactions

The following classification has been adopted for the purpose of comparison:—

1. *Slight.*—Cases which at any time during treatment developed local reaction not exceeding 1 in. in diameter, either with or without slight malaise.
2. *Moderate.*—A local reaction occurring at any time during treatment, extending from 1 to 3 in. in diameter, whether accompanied by pain and malaise or not.
3. *Severe.*—Any local reaction exceeding 3 in. in diameter, whether with or without general reaction.

B6219 (9 cases).—No reactions.
B6217 (132 cases).—Reactions in 6 per cent.
B6539 (150 cases).—Reactions in 55·9 per cent.
B6707 (220 cases).—Reactions in 35·8 per cent.

TABLE II.—*Analysis of Reactions with B6217*

Nature of reaction.	Cases.	Percentage of total.
Slight	5	3·7
Moderate	1	0·8
Severe	2	1·5
Total ..	8	6·0

Induration occurred in four patients (3·0 per cent.), none of whom had suffered from reactions.

TABLE III.—*Analysis of Reactions with B6539*

Nature of reaction.	Cases.	Percentage of total.
Slight	37	24·6
Moderate	44	29·3
Severe	3	2·0
Total ..	84	55·9

There is a considerable increase in the number

and proportion of the reactions with B6539 as compared with the two previous batches. The great bulk fall under the "slight" and "moderate" groups, only three severe reactions being recorded. Reference to the table of relative composition shows that, as compared with B6219 and B6217, there is a very definite increase in the strength of the toxoid, the percentage of alum, and the Lf value of this antigen. These factors undoubtedly appear to be concerned in the increased tendency towards reactions, though which particular one is not quite so clear.

With these three batches the procedure was at first to administer 0·5 c.cm. as a preliminary dose followed by two further doses of 1 c.cm. each at fortnightly intervals. When using B6217, after a number of early cases had been dealt with, those who subsequently came for treatment received a full dose of 1 c.cm. on all three occasions. This procedure was not followed by any untoward results. During the course of treatment with B6539 it was noted that there was no regularity in the order of occurrence of reactions. In several instances, for example, the reaction occurred only after the third injection, and in many cases a moderate or, perhaps, severe reaction was experienced after the third when only a mild reaction had occurred with the second or first injection. This is in distinct contrast to our experience with toxoid-antitoxin, in which the reaction to the first dose of 1 c.cm. has been found to be a fairly reliable index to the subsequent reactions. This feature appears to be peculiar to alum-toxoid, and it seems desirable therefore to discuss it more fully. The following analysis of cases treated with B6539 is based on the different grades of reaction according to the time of their occurrence:—

(*a*) Slight reactions:	
(1) After third dose only	7
(2) After second and third doses only	8
(3) After all three doses	22
	37
(*b*) Moderate reactions:	
(1) After third dose only	9
(2) After third dose but with slight after second	13
(3) After third only, but with slight after first and second	2
(4) After both second and third doses	8
(5) After all three doses	12
	44
(*c*) Severe reactions:	
(1) After third dose only	1
(2) After second dose (third injection with floccules)	1
(3) After first dose (treatment discontinued)	1

On the whole, the reactions with this batch did not give rise to any real anxiety. In one instance it was necessary to change over to floccules after the second injection, and only in one case was it necessary to discontinue treatment after the first injection: in a boy 16 years old, resident in an institution. Such cases have been experienced also with T.A.M., especially among adolescents. Three cases of induration (2 per cent.) were noted with this batch (vide infra). In one case there was no accompanying reaction, and of the remaining two, in one there was slight reaction after the second and third injections, and in the other there was a severe reaction after the last dose.

TABLE IV.—*Analysis of Reactions with B6707*

Nature of reaction.	Cases.	Percentage of total.
Slight	35	15·9
Moderate	28	12·7
Severe	16	7·2
Total	79	35·8

The proportion of reactions with this batch is definitely smaller than with B6539. Comparison of the relative composition of the two batches would lead one to expect that the reverse would be the case. The apparent discrepancy is probably due to the fact that the large bulk of the B6539 cases were treated in residential institutions and it was possible to maintain effective following-up, with the result that reactions which might otherwise have escaped notice were observed. On the other hand, all the B6707 cases were treated at the Immunisation Clinic and it is likely that quite a large proportion of the reactions (particularly those of milder degrees) were not reported at all. It is not likely that more than a few severe reactions escaped notice.

In the annotation[2] to the article referred to above mention has been made of a factor which is of definite importance in this country. Small-pox vaccination is still compulsory, and it has been ascertained that over 80 per cent. of the present school population in Cork has been vaccinated. Parents are therefore quite familiar with the more or less severe inflammatory reactions inseparable from vaccination and are undoubtedly apt to make light of reactions associated with diphtheria immunisation. Indeed, there have been many cases in which the mother complained that "the inoculation did not take" because there was no reaction. This factor must be borne in mind, and it may possibly have detracted from the accuracy of our figures. I feel fairly confident, however, in stating that the degree of vitiation cannot be very pronounced, and that it probably affects only batch B6707 and only the milder groups of reactions in that batch.

There is definite increase in the proportion of severe reactions experienced with B6707 (7·2 per cent. as compared with 1 per cent. and 3 per cent. respectively with B6217 and B6539), and this is what one would expect from the relative composition of the three batches. Undoubtedly B6707 is a very efficient prophylactic, but we have experienced more trouble with it than with any other batch we have handled. Reactions have been definitely more pronounced and at one time indurations were a real source of concern. In no less than 33 cases (15 per cent. of the total) such indurations occurred (vide infra). The different degrees of reaction according to their time of occurrence are analysed as follows:—

(*a*) Slight reactions:	
(1) After third dose only	5
(2) After second and third doses only	9
(3) After all three doses	21
	35
(*b*) Moderate reactions:	
(1) After third dose only	1
(2) After third with slight after second dose	4
(3) After second and third doses	14
(4) After all three doses	9
	28
(*c*) Severe reactions:	
(1) After third dose only	3
(2) After second and third doses	7
(3) After all three doses	6
	16

Induration

The following standards of comparison have been adopted:—

1. *Slight.*—Transient thickening and hardening of the subcutaneous tissues about the size of a pea.
2. *Moderate.*—As above, but attaining approximately to the size of a broad bean.
3. *Marked.*—As above, but attaining to the size of a florin piece or more, or *any* induration lasting more than two months and including *all* cases in which there has been abscess formation.

Induration in connexion with the use of alum-toxoid is undoubtedly important, and the tendency to it may possibly act as a deterrent to the more

widespread use of this antigen. A slight degree of induration should, however, by no means be regarded as an absolute contra-indication to its use, for the rationale of alum-toxoid prophylaxis suggests that some such induration may be looked for, although experience has shown that in the great majority of cases it either does not appear at all or appears in such slight and transient degree as to escape observation. On the other hand, there have been cases in which very marked and semi-permanent induration has developed, but here again, fortunately, our experience has suggested that such events may be avoided by the use of suitably graded antigens.

In the following analysis the procedure adopted was the examination of all records for induration, followed by personal examination of each case with a view to determining whether the varying degrees of induration were permanent in character or not. Only nine children received treatment with B6219 and there were no cases of induration amongst them.

With B6217 there were four cases of mild induration amongst the 132 children treated. They were re-examined recently—i.e., about two years after treatment. There was no trace whatever of any hardening, nor was there any history of trouble arising therefrom in the interval. The condition had, in fact, not drawn any attention.

With B6539 150 children received treatment, and there were three definitely established cases of induration (two of which were mild and one moderate). Re-examination was recently carried out (1½ years after treatment) and in no case was there any trace of induration. The children were in excellent health. In addition it was decided to re-examine *all* the institutional children (69 in number) treated with this batch, and they were seen 1⅔ years after treatment. There was no trace of induration in any of them and, apart from the initial reactions, there was no history of any trouble in the meantime.

B6707 caused more trouble with induration than any of the others which we have tried. In all, 33 cases occurred among 220 children; 18 have been classified as mild, 6 as moderate, and 9 as marked. All these were re-examined between Dec. 9th and 12th, 1932, and the findings are tabulated as follows:—

(*a*) *Mild.*—The average interval between treatment and re-examination was 12 months. In no instance was there evidence of induration.

(*b*) *Moderate.*—Average duration between treatment and re-examination was 14 months. No sign of induration present in any case.

(*c*) *Marked.*—The whole question of the suitability of alum-toxoid as a diphtheria prophylactic hinges around these cases. As they are obviously, therefore, of the greatest importance they are discussed individually. It will be noted that some of them developed abscesses, and this aspect is considered separately. In each instance (unless otherwise stated) the procedure was to administer at fortnightly intervals 0·5 c.cm., 1 c.cm., and 1 c.cm. of the prophylactic.

(1) A. B., male (3 years). July 23rd, 1931: Treatment completed. No reactions during treatment, no induration noticed during course. Oct. 2nd: Schick test pseudo-negative. Small indurated mass noted in back of right upper arm. No pain or tenderness. Dec. 7th, 1932: No trace of induration.

(2) B. C., female (8¾ years). July 30th, 1931: Treatment completed. Moderate reaction after second dose. More marked reaction after third. Oct. 9th: Schick test. Moderate induration noted over back of left arm. (Did not reattend for reading of Schick test.) Dec. 7th, 1932: No trace of induration.

(3) C. D., male (10 years).

June 25th, 1931 ..	0·5 c.cm.	A.M.T.	Moderate reaction.
July 9th, „ ..	0·5 „	„	Severe reaction.
July 23rd, „ ..	1·0 „	T.A.F.	No reaction.
August 6th, „ ..	1·0 „	„	„ „

After second dose of A.M.T. developed a very marked inflammatory reaction, extending practically from shoulder to elbow. Gradually subsided to an area of about 2½ sq. in., over which inflammation persisted for some time longer and which appeared at one time to be going on to abscess formation. Eventually cleared up completely. Sept. 25th: Schick test negative. Some redness still present over back of left arm. No pain or tenderness. Dec. 7th, 1932: No trace of induration. Arm quite normal in all respects. General health excellent.

(4) E. F., male (2 years). July 30th, 1931: Treatment completed. There were no reactions during the course, nor was any induration noted. Oct. 2nd: Schick test negative. Induration noted in both upper arms, about 1 in. in diameter. April 5th, 1932: Induration still quite pronounced. Hard, painless swellings. Dec. 8th: No trace of induration in either arm, but history of development of abscess three months ago (vide infra).

(5) F. G., female (5½ years). July 16th, 1931: Completed treatment. No reactions nor any induration during treatment. Sept. 25th: Schick test negative. Indurated mass about 1 in. in diameter noted over back of left upper arm. Asked to reattend in two months but did not do so. Dec. 7th, 1932: No trace of induration, but developed abscess in interval (vide infra).

(6) G. H., male (5 years). Oct. 8th, 1931: 0·5 c.cm. A.M.T. Severe local reaction. Oct. 29th: 1·0 c.cm. T.A.F. Inflammation and induration present in affected arm. No reaction after T.A.F. Nov. 19th: 1·0 c.cm. T.A.F. No reaction. Inflammation still present in affected arm. An abscess subsequently developed (vide infra). Feb. 2nd, 1932: Schick test negative. No sign of inflammation. Dec. 7th: No trace of induration.

(7) H. J., female (6½ years). Oct. 8th, 1931: 0·5 c.cm. A.M.T. Severe local and general reaction. Oct. 29th: 1·0 c.cm. T.A.F. Slight local reaction. Inflammatory reaction still present in other arm. Nov. 19th: 1·0 c.cm. T.A.F. Slight reaction. Abscess on left arm, now discharging (vide infra). Feb. 2nd, 1932: Schick test negative. A small area (about 0·5 sq. in.) of inflammation still on left arm. No discharge. Dec. 8th: No induration; arm quite normal.

(8) J. K., female (1 7/12 years). Nov. 5th, 1931: Completed treatment. No reactions nor any induration noticed. Feb. 2nd, 1932: Schick test negative. Induration noted for first time. Mass about the size of a small bean. August 12th: Induration still present. Slight redness of overlying skin. Dec. 7th: Still a small amount of induration (about the size of a pea). Quite painless and soft. No inflammation. Evidently absorbing.

(9) K. L., female (1½ years).

June 11th, 1931 ..	0·25 c.cm.	A.M.T.	No reaction.
June 18th, „ ..	0·5 „	„	„ „
July 2nd, „ ..	0·75 „	„	„ „
July 9th, „ ..	1·0 „	„	„ „

This was one of the first cases treated with this batch, hence the modified technique. No untoward results noted. Sept. 25th: Schick test negative. Quite well. Marked induration now noted (about 1 in. in diameter). No inflammation. Asked to attend subsequently but did not do so. Dec. 7th, 1932: Induration still present and of about the same extent, but now quite soft. Can be felt as a pliable plaque under skin of upper arm. No inflammation, general health excellent.

Of this subgroup Cases 1 and 2 do not call for further comment. Induration, though persistent, was in reality of slight extent and eventually cleared up completely. Case 3 appeared at one time to be going on to abscess formation, but eventually made a complete recovery, while Cases 4 to 7 are discussed under the heading of abscess formation. There remain, therefore, at this juncture only Cases 8 and 9. In these two instances there certainly has been unduly long persistence of induration (13 months and 17 months respectively), but in one the actual amount of induration is very slight indeed, and in the other the affected part presents signs of active absorption. We have repeatedly noted softening as the preliminary stage to resolution in these conditions.

Our experience of induration in connexion with the

use of alum-toxoid may therefore be summarised as follows:—

(1) B6219. 9 children treated; no cases of induration.
(2) B6217. 132 children treated; 4 cases (3 per cent.) developed mild induration.
(3) B6539. 150 children treated; 2 cases (1·3 per cent.) developed mild and 1 case (approximately 0·6 per cent.) moderate induration.
(4) B6707. 220 children treated; 18 (8·2 per cent.) developed mild induration, 6 (2·8 per cent.) moderate induration, and 9 (approximately 4·1 per cent.) marked induration.

Abscess Formation

Abscesses occurred in four instances. These cases gave rise to a certain amount of anxiety, but eventually they all ended satisfactorily. Their appearance is, perhaps, of greater importance than that of induration alone; they are therefore considered in detail. In each instance the prophylactic used was B6707, and abscess formation was a sequel to induration.

(1) E. F., male (2 years). July 2nd, 1931: 0·5 c.cm. No reaction. July 16th: 1·0 c.cm. No reaction. July 30th: 1·0 c.cm. No reaction, but subsequently developed well-marked induration in both arms. Oct. 2nd: Schick test negative. Induration still present, about the size of a bean. April 5th, 1932: Induration still present and of about same size. Hard, painless swellings, apt to become irritable at times. September: Developed localised abscess on right arm which pointed, discharged for a short time, and then healed completely. Dec. 7th: Now a small healed scar on right arm, but no trace of induration. Apart from occasional periods of irritability, up to the time of abscess formation the induration caused no discomfort whatever and the child's general health was excellent. Eventually he made satisfactory recovery with disappearance of all traces of induration and inflammation. He is now quite well and strong.

(2) G. H., male (5 years). The preliminary dose of 0·5 c.cm. of A.M.T. was followed by a marked local reaction with subsequent induration. The severity of the initial reaction necessitated a change to floccules for the further treatment. About the third week what appeared to be a localised cold abscess developed. This did not go on to actual suppuration and gradually absorbed. He was examined about four months after the initial dose and there was then no sign of inflammation but still a slight degree of induration. Seen again ten months later (Dec. 8th, 1932), the arm was quite normal in every respect.

(3) H. J., female (6½ years). A sister to the last named. Initial dose of 0·5 c.cm. of A.M.T. was followed by a marked local and general reaction (necessitating a change over to floccules) and the development of a localised cold abscess which pointed and discharged. Three weeks later there was a definite improvement in her condition, although the local inflammation was still present. Three months after the last dose she was Schick-tested and there was then a small zone of about 1 cm. in diameter over which the skin had a bluish-red indurated appearance. There was no discharge. Eight months later (Dec. 9th, 1932) she was re-examined; apart from a small healed scar about 3 or 4 in. in diameter the arm was normal. There was no trace of induration.

Both these children were definitely undernourished and lived under very poor conditions in a single-room tenement.

(4) F. G., female (5½ years). An initial dose of 0·5 c.cm. was followed by two further doses of 1 c.cm. each. The date of last dose was July 16th, 1931. At no time during this course was there more than a slight reaction, nor was there any evidence of induration. She was Schick-tested on Sept. 25th, 1932 (negative) and moderate induration was noted in the left arm. She did not report further and was not seen again until Dec. 9th, 1932, during the course of a general follow-up, when a small healed scar, about 3 mm. in diameter, was detected on the back of the left arm. It then transpired that she had developed an abscess which pointed and discharged for a few days after which it healed up rapidly. The parents thought so little of it that they did not report it. At the time of re-examination there was no trace of inflammation or induration and her general health was excellent.

Cases Necessitating a Change-over in Treatment to Floccules

In the whole series there were eight cases in which floccules had to be used. No change was necessary in any instance with either B6219 or B6217. In all cases the reactions (if any) with both these batches were comparatively mild in character and gave rise to no anxiety whatever.

B6539 (1 *case*, 0·6 *per cent.*).
L. M., female (7¾ years).

June 19th, 1931	..	Schick test positive (marked).
June 23rd, ,,	..	A.M.T. 0·5 c.cm. Severe local reaction.
July 9th, ,,	..	A.M.T. 0·5 c.cm. Severe local reaction.
July 23rd, ,,	..	T.A.F. 1·0 c.cm. No reaction.
August 6th, ,,	..	T.A.F. 1·0 c.cm. No reaction.
Oct. 2nd, ,,	..	Schick test negative.

B6707 (7 *cases*, 3 *per cent.*).
(1) N. O., female (6¼ years).

Nov. 19th, 1931	..	A.M.T. 0·5 c.cm. Slight local reaction.
Dec. 3rd, ,,	..	A.M.T. 1·0 c.cm. Moderate reaction.
Dec. 17th, ,,	..	T.A.F. 1·0 c.cm. No reaction.
March 11th, 1932	..	Schick test negative.

(2) O. P., male (4 years).

Oct. 8th, 1931	..	A.M.T. 0·5 c.cm. Marked local reaction.
Oct. 29th, ,,	..	T.A.F. 1·0 c.cm. No reaction.
Nov. 19th, ,,	..	T.A.F. 1·0 c.cm. No reaction.
Feb. 2nd, 1932	..	Schick test positive.
Feb. 5th, ,,	..	A.M.T. 1·0 c.cm. Did not report again.

(3) P. R., female (11 years).

June 18th, 1931	..	A.M.T. 0·5 c.cm. Moderate local reaction.
July 2nd, ,,	..	A.M.T. 1·0 c.cm. Severe local and general reaction.
July 16th, ,,	..	T.A.F. 1·0 c.cm. Slight reaction.
Oct. 6th, ,,	..	Schick test pseudo-negative.

(4) R. S., male (4½ years).

Nov. 19th, 1931	..	A.M.T. 0·5 c.cm. Marked local and general reaction.
Dec. 3rd, ,,	..	A.M.T. 0·5 c.cm. Marked local reaction; induration.
Dec. 17th, ,,	..	T.A.F. 1·0 c.cm. No reaction.
March 11th, 1932	..	Schick test negative. No induration now.

The remaining cases in this group have been dealt with under the heading of "Induration" (Cases 3, 6, and 7 respectively).

In addition to the cases referred to above, there is another group of 30 children who were excluded because, through shortage of supplies, recourse had to be had to different antigens. In some cases treatment was completed with another batch of A.M.T. and in some with T.A.M. These cases do not affect the figures quoted except, perhaps, in a favourable manner. Only one case need be alluded to. This was a girl aged 5 years, who five days after the first dose (1 c.cm. of B6217) developed a moderate reaction. A similar reaction, again five days later, developed after the second dose (1 c.cm. of B6539). The last dose was administered in two fractions of 0·5 c.cm. each (B6217) and there was no reaction after either. This was the only case in the whole series in which a delayed reaction was noted.

Discussion

It is at once apparent that practically all the trouble experienced during the administration of alum-toxoid has been occasioned by the batch B6707. At no time did any of the other batches give rise to a degree of anxiety any greater than that to which we had been accustomed in connexion with the use of toxoid-antitoxin. It is true that B6539 was somewhat more troublesome than either of its predecessors, B6217 and B6219. The clue to these differences of behaviour appears to lie in the varying alum-content of the different batches, and possibly also in the Lf value of each (see Table I.). With B6539 a tendency rather towards more frequent reactions than towards induration has been the distinguishing feature as compared with B6217 but, as pointed out above, this difference may be largely due to the better following-up in this group, a large bulk of whom were institutional children. Of the children in this group 2 per cent. manifested

in duration, as compared with 3 per cent. in the group treated with B6217. With B6707 there is a big increase (15 per cent.) in the cases of induration and, while it is true that this induration does not appear to be permanent, its long persistence in some instances, coupled with the tendency to abscess formation in others, definitely precludes the recommendation of this batch as a prophylactic for general use, notwithstanding the fact that it appears to be an antigen of very high potency.

In the light of our experience, then, it may be said that B6707 is not a suitable prophylactic but, apart from this particular batch, there is very little to choose, so far as reactions are concerned, between toxoid-antitoxin and alum-toxoid. It must not be forgotten that reactions of the utmost severity may occasionally be encountered with toxoid-antitoxin, and many cases come under our notice in which the whole of the upper arm has been involved in an intense inflammatory reaction accompanied by marked prostration. Generally speaking, the severe reactions to alum-toxoid have been more limited in extent, but have had sharply demarcated edges and have been of a more livid type. Usually such reactions manifested themselves after the second dose (1 c.cm.), and if a further dose of 1 c.cm. was administered a very severe reaction was almost certain. We have nearly always been able to avoid such reactions with the third dose by administering it in two fractions of 0·5 c.cm. each. It is really surprising how successful this technique has proved, and it has worked equally well in the case of severe reactions with the initial dose of toxoid-antitoxin. On the other hand, if a severe reaction results from the initial dose of 0·5 c.cm. of alum-toxoid, it is useless to pursue treatment further with this antigen and the only course is to change over to floccules. That this procedure has been necessary in only eight instances altogether appears to be sufficient evidence that, on the score of reactions alone, there is little to be said against the use of alum-toxoid.

My interest in this matter has been solely that of the field epidemiologist. To cope with a long-standing and widespread epidemic of diphtheria, a campaign of active immunisation was initiated in which toxoid-antitoxin was the prophylactic used, but the success of the effort was greatly hampered by the continued occurrence of reported cases of diphtheria among treated or partially treated children. It was in an attempt to prevent such cases that alum-toxoid was introduced, following the work of Glenny.[3] In my previous paper [1] reference was made to the fact that three alum-toxoid treated children had been reported as suffering from diphtheria, but an analysis of the cases showed that they could not be regarded as having been properly treated. Since then two further cases have been reported. In one, only a single dose of 0·5 c.cm. B6217 had been administered. In the other, not only had a full course of B6539 been given, but a subsequent Schick test proved negative. In this case the diagnosis proved unfounded. So again, for practical purposes, it may be stated that so far there has been no case of diphtheria among alum-toxoid treated children.

On the other hand, it has been shown that there has been an incidence of 2·35 per 1000 (representing 11 cases) of confirmed diphtheria among children treated with toxoid-antitoxin (10·73 per 1000 if all notified cases are included).

Reference has been made to cases in which it was necessary to change over to floccules (T.A.F.). From the point of view of freedom from reactions there is scarcely any doubt that T.A.F. is the best prophylactic and is the antigen of choice where considerations of expense do not enter, but it has to be ruled out on the score of cost in a general campaign of diphtheria immunisation. The work of Dudley [4] on the relative value of diphtheria prophylactics shows that "strong" toxoid may possibly be of great help in the future in inducing rapid and high immunity. It is interesting to note that he found a more rapid development of immunity among entrants treated with "weak" toxoid than those treated with "weak" floccules, which he attributes to the fact that the former is a clear colloidal solution while the latter is a particulate suspension. Our experience with alum-toxoid (which contains a relatively very heavy precipitate) would certainly seem to indicate that the induction of immunity was definitely more rapid than with toxoid-antitoxin.

The work of Wells, Graham, and Havens [5] with alum-toxoid seems to indicate that it may yet be possible to induce immunity with a single injection. Of 98 Schick-positive children who received a single dose of 1 c.cm., 92 (or 94 per cent.) were negative within eight weeks. In a recent communication to me Dr. Havens has detailed their further experience in which 797 children have been under observation and in whom a single injection of 1 c.cm. of alum-precipitated toxoid has induced immunity in no less than 96·5 per cent. So far as our work has gone, it seems clearly to indicate that alum-toxoid is at least worth a more extended trial, and also seems to show that there is a very definite relationship between the unpleasant reactions and the composition of the particular batch. Theoretically, the ideal combination appears to be a low alum-content with an undiluted toxoid of moderately high Lf value.

A few cases (38 altogether) have been recently tried with two new batches: B6772 (7·5 per cent. alum, 12 Lf per c.cm.) and B7064 (2 per cent. alum, 16 Lf per c.cm.). Slight and transient induration developed in approximately half the cases and all the children who were known to be Schick positive before treatment were negative when tested three months later. The rationale of alum-toxoid prophylaxis indicates that a certain amount of induration at the site of introduction is to be expected. If it can be shown that this is transient the method seems to be well worth while, for the effects so far observed in human beings appear to have amply confirmed the work of Glenny [3] and Ramon [6] on lower animals, in which they have shown that delayed absorption has the effect of enormously increasing the antigenic response of the organism.

REFERENCES

1. Saunders, J. C.: THE LANCET, 1932, ii., 1048.
2. Ibid., p. 1069.
3. Glenny, A. T.: Brit. Med. Jour., 1930, ii., 244.
4. Dudley, S. F.: Quart. Jour. Med., 1932, i., 213.
5. Wells, D. M., Graham, A. H., and Havens, L. C.: Amer. Jour. Pub. Health, 1932, xxii., 648.
6. Ramon, G.: Ann. de l'Instit. Pasteur, 1926, xl., 1.

PATIENTS' LIBRARY AT GUY'S HOSPITAL.—Two years ago a lending library for patients was started at Guy's. The hospital advanced £40, which is gradually being paid back, for the installation of bookshelves and the making of trolleys in which to push the books round the wards. The stock-in-trade was all given by friends of the hospital, and in the librarian's report for 1932 it is stated that there are now 4800 books and that during the year 25,308 issues were made. The whole service is entirely voluntary, and only in the paying wards is a small charge made. Last September the service was extended to the nurses. St. Saviour's public library is in future to coöperate and help the library to supply books on special subjects—such as Diesel engines, and the vaulting of the Sistine Chapel which the librarian confesses baffled her this year.

LOWER SEGMENT CÆSAREAN SECTION*

THE USE OF WILLETT'S SCALP FORCEPS AND A UTERINE COMPRESSOR

BY VICTOR BONNEY, M.S., M.D., B.Sc. LOND., F.R.C.S. ENG., F.R.A.C.S.

GYNÆCOLOGICAL SURGEON TO THE MIDDLESEX HOSPITAL

THE chief technical drawback to classical Cæsarean section is that the child, being delivered, by a species of version, breech first, incurs the risks peculiar to breech delivery and the trauma associated with version. The lower segment operation, on the other hand, achieves delivery of the child head first, and this appears to me to be its principal advantage. Of the various methods of extracting the head, however, none up till lately has in my judgment been entirely satisfactory.

Traction by forceps either of the ordinary midwifery pattern or specially made for the purpose has the disadvantage that their proper application is difficult when the operator's view is obscured by blood from the uterine incision. Prising the head out, either by a single forceps blade or by the hand, carries with it the risk of dangerously enlarging the transverse incision in the thin and often fragile wall of the lower segment by tearing it. Moreover, all these three methods necessitate the making of an incision large

FIG. 1.—The uterine compressor.

enough to take the child's head before they are entered upon, and there is a liability to make it either too large or too small, the latter mistake being the most serious because as the head is being delivered the uterine wound will tear.

To obviate these drawbacks I have lately been extracting the head by Willett's scalp forceps, which were originally designed to allow of traction being applied to the head through a partly dilated cervix in cases of placenta prævia. These forceps can be applied to the head through a very small incision and once they are applied and pulled upon the pressure of the head on the uterine wall stops any bleeding and the operator can unhurriedly proceed to enlarge the opening until the head slips through without any tearing.

The amount of bleeding from the uterine incision in the lower segment operation varies immensely in different cases, just as it does in the classical operation.

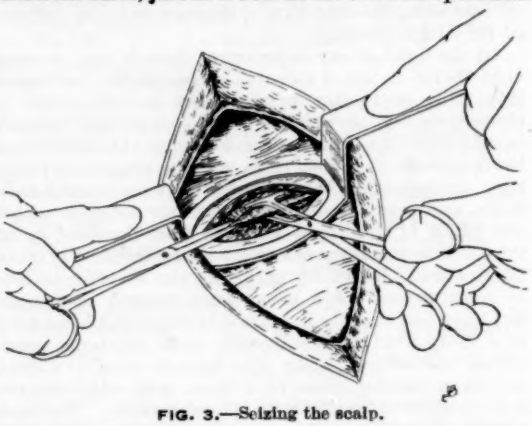

FIG. 3.—Seizing the scalp.

It may be very slight, especially if the patient be already in labour and the uterus strongly contracting, but sometimes, particularly if labour has not started, it is exceedingly free, so that even from the small cut necessary to apply the scalp forceps a flow occurs so profuse as to obscure the whole field. I therefore bethought me of the old device of pressing on the uterine wall a flattened-out Hodge pessary within the boundary of which the uterine incision was made. The device, as applied to the classical operation, was not very satisfactory because being applied to the uterine wall over the soft body of the child the pressure obtained was often insufficient to stop bleeding. It is otherwise, however, when the pressure is made over the hard head. In that situation complete hæmostasis is effected, and after trying a flattened-out Hodge pessary and proving it satisfactory I had made the uterine compressor shown in Fig. 1.

TECHNIQUE OF THE OPERATION

The technique of the operation is therefore as follows. An incision through the abdominal wall is

*Delivered before the British Congress of Obstetrics and Gynæcology on April 6th.

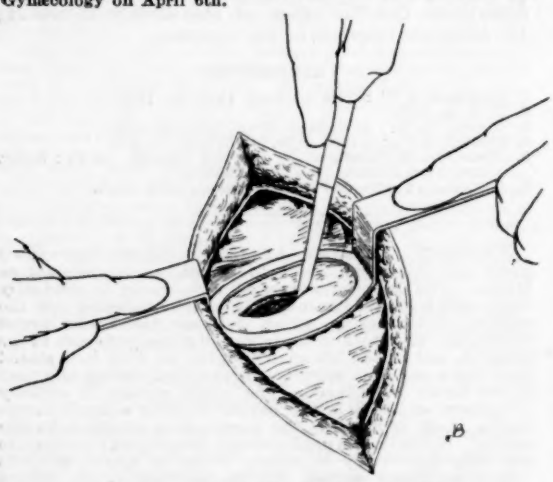

FIG. 2.—Applying the uterine compressor.

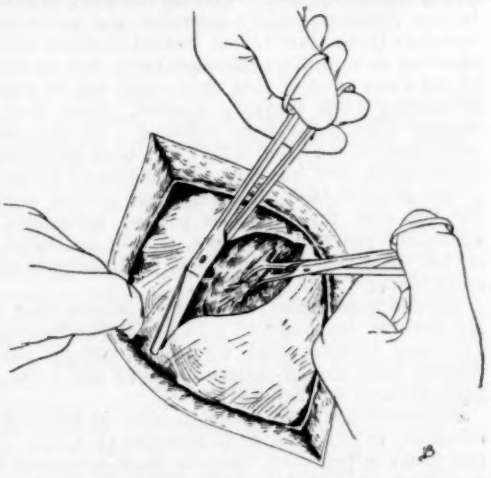

FIG. 4.—Enlarging the uterine incision to the left.

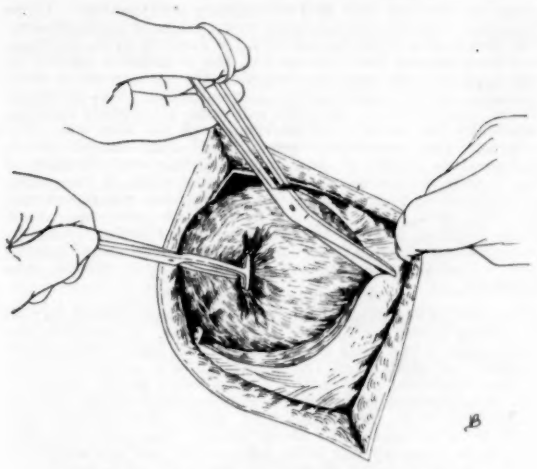

FIG. 5.—Enlarging the uterine incision to the right.

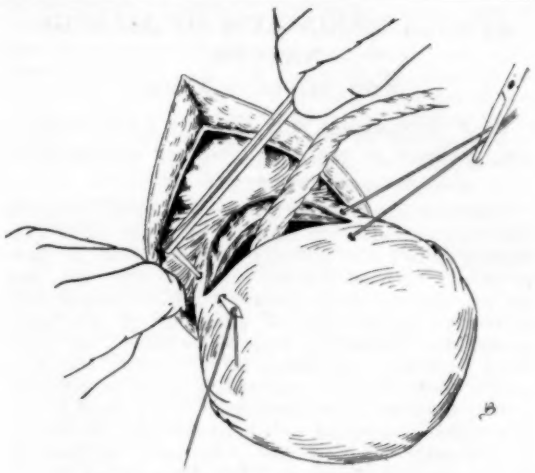

FIG. 6.—Inserting the traction sutures.

made from near the umbilicus to the pubis. This is rather larger than is required in the classical operation, but a smaller incision makes it difficult to eventrate the uterus if that be desired. The uterus being packed round with wet saline gauze, the head is defined and the uterine compressor applied over it. A transverse incision about 1½ inches long is now bloodlessly made within the space compassed by the compressor until the scalp shows. (Fig. 2.) It is not necessary, unless the head is lying very low, to turn back a peritoneal flap, for if the incision is made through the loose peritoneum a flap falls back of itself. The scalp is then "rucked up" with a pair of fine-toothed forceps until sufficient is loose to firmly apply the scalp forceps. (Fig. 3.) Traction is now made on the scalp and the compressor removed, for the pressure of the head now prevents any bleeding from the uterine incision. By a series of scissor snips alternately on either side the incision is enlarged with a slight curve upwards until the head gently slips out. (Figs. 4 and 5.) The scalp forceps, which scarcely mark the child, are then removed and the body is withdrawn, after which the operator immediately inserts a suture just outside each extremity of the uterine wound, the uterus having been previously eventrated or not as the case seems to require. (Fig. 6.) These sutures, which are not at first tied, are used as tractors to keep the wound well within the operator's view. The placenta is then extracted and the wound sutured. I insert three mattress sutures, then tie one of the traction sutures and use one end of it to run a continuous suture along the muscle, and then tie the other and use one end of it to suture the peritoneal flap to the uterus. (Figs. 7 and 8.)

I hope that surgeons interested in obstetric work will give this technique a trial. They will find, as I have done, that it makes lower segment Cæsarean section a much more satisfactory operation than heretofore, both as regards the woman, who loses but little blood, and the child, whose birth is effected with a gentleness much greater than obtains in any other form of delivery. Thus performed, lower segment Cæsarean section is a procedure far preferable for all cases to the classical operation which was wittily described by my colleague, Douglas MacLeod, as being by comparison a "smash and grab raid."

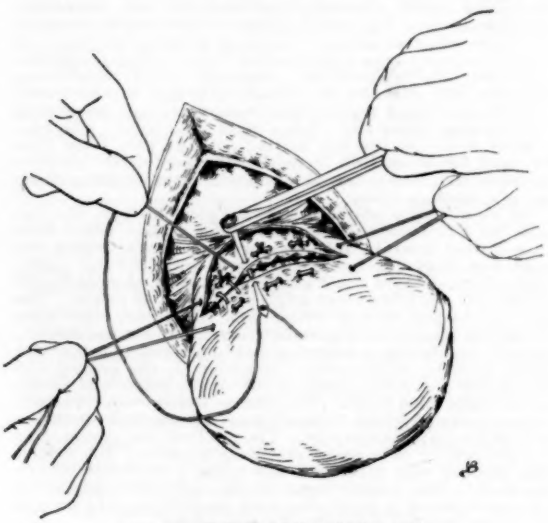

FIG. 7.—Suture of the uterine wall.

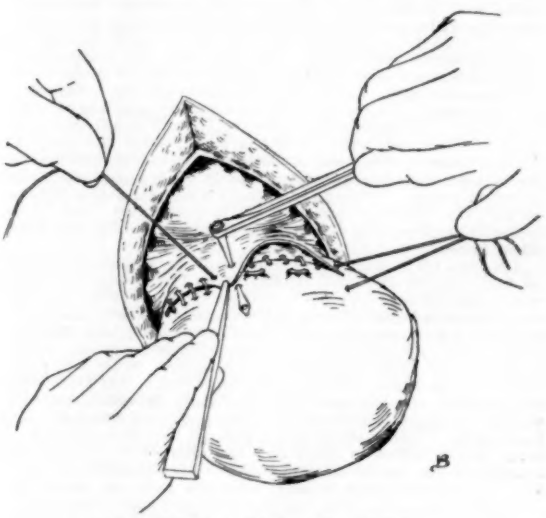

FIG. 8.—Suture of the peritoneal flap.

SEROUS MENINGITIS OF ALLERGIC NATURE

WITH REPORT OF A CASE

By J. H. Sheldon, M.D. Lond., F.R.C.P. Lond.

HON. PHYSICIAN TO THE ROYAL HOSPITAL, WOLVERHAMPTON

This is a case in which an attack of acute tonsillitis was followed after an interval of about eight days (during which the initial illness appeared to have subsided) by a generalised scarlatiniform rash, and by two groups of symptoms which developed concurrently: (*a*) a series of affections of the larger joints, characterised by pain and effusion, the latter being especially prominent in the knees; and (*b*) a serous meningitis, of sufficient severity to give rise to four dioptres of papilloedema. Both these groups of symptoms subsided as a peritoneal abscess due to a hæmolytic streptococcus developed; its drainage led to complete recovery. The diagnosis of hydrocephalus, due to a serous meningitis, is established by the normal character of the cerebro-spinal fluid, its increased pressure, and the subsidence of symptoms, including the papilloedema, after two lumbar punctures. The nature of the effusion into the joints was not established by puncture of a joint, but its complete subsidence in every case indicates that the fluid was certainly not purulent, and it may be assumed to have been serous.

HISTORY OF ILLNESS

A married woman, aged 23, had suffered from sore-throats and quinsies for several years, but apart from this her health had been good until after the birth of her first child in 1928, when she had suffered from pain in the right iliac fossa and from menorrhagia. After her second confinement in September, 1930, she had consulted a gynæcologist, who had diagnosed a retroverted uterus and an enlarged right ovary. Operative treatment was recommended and refused. Apart from symptoms due to this condition her health remained good until the present illness, which began on Dec. 5th, 1931. On that day she did not feel well but was able to go to a neighbouring town to do some shopping. Next day she felt "ill generally," the most prominent symptoms being a sore-throat and aching in the limbs.

On Dec. 7th she called in Dr. V. M. Lambah, of Bilston, who found her complaining of the same symptoms, with a temperature of 102° F. Both tonsils were swollen and inflamed, especially the left, but no other abnormalities were discovered, and the condition was considered to be due either to an acute tonsillitis or to influenza. She was treated with salicylates and salicin. Next day the tonsils were still swollen, but the general condition was much better, and in particular the aching in the limbs was easier.

On Dec. 9th the temperature had fallen to 99° F. and she was obviously recovering. On the 11th the temperature was subnormal and she was feeling so much better that she was anxious to know when she could get up. Next day she appeared to have made a good recovery and was allowed to get up. In the evening, however, she suffered from severe pain in the head, which was felt chiefly over the occiput. In the morning this pain in the head was better, but during the course of the day it became steadily worse and at night she vomited twice. She says that on this day she felt a change in her eyes which she describes as "feeling glassy" and that, quite apart from the headache and vomiting, she felt very ill in herself.

On Dec. 14th there was severe headache and also stiffness of and pain in the back of the neck, the condition being very suggestive of an early meningitis. In addition to this, she now complained of pain in the shoulder, elbow, and wrist of the left arm, and the left wrist-joint was slightly swollen. Treatment with salicylates was accordingly renewed. Next morning the head appeared to be better, while the pain in the joints of the left arm was unaffected. On Dec. 16th the pains in the left arm had practically subsided, but the stiffness and pain in the back of the neck had again greatly increased. Examination of the patient this day revealed a rash, which seems to have had the character of a diffuse scarlatiniform erythema, and to have been distributed over the whole body, with greatest intensity over the shoulders and left arm. The rash did not itch, and had disappeared by the next day, when the neck was again better and the pains in the left arm had completely disappeared. There was now, however, similar pain in the joints of the right arm. She was seen in consultation with Dr. Lambah in the evening.

There was no head retraction, but a definite rigidity of the neck accompanied by considerable tenderness on deep pressure over the joints of the cervical spine. The shoulder, elbow, and wrist on the right side were all slightly swollen, especially the wrist, and movement of the arm was very painful. Her mentality was bright and, except for a temperature of 101° F. and some injection and swelling of the tonsils, no abnormalities were found until, in the course of a routine examination, severe papilloedema was discovered in both eyes. The swelling of the discs measured about three dioptres, but no other changes were noted in the fundi. A rough test did not reveal any diminution of visual acuity, and a careful examination of the nervous system was negative.

SPECIAL INVESTIGATIONS

In view of the papilloedema, she was removed next day to a nursing home for further investigations. A stereoscopic radiogram of the skull was normal. The nasal sinuses were normal. A swab from the tonsils gave a profuse growth of *Staphylococcus aureus* with pneumococci in fair numbers. The Wassermann test and the complement-fixation test for gonorrhœa were negative. The urine contained a very faint trace of sugar, but no albumin. The sediment contained very scanty red cells, with a few pus and epithelial cells. A blood count showed 75 per cent. of hæmoglobin, 3,900,000 red cells, and 20,000 white cells per c.mm., with a differential count of polymorphs 78 per cent.; lymphocytes, 20 per cent.; monocytes, 1 per cent.; and eosinophils, 1 per cent. Cerebro-spinal fluid showed: cells, under 1 per c.mm.; protein, 25 mg. per 100 c.cm.; globulin, not in excess; sugar, 0·081 per cent.; chlorides, 0·73 per cent.; no growth on culture. (I am indebted to Dr. S. C. Dyke for these reports.)

The pain in the right arm was much better this day, and she could now move the arm freely, the swelling in the joints having practically disappeared. She complained, however, of pain in both knees, which she said had come on suddenly while she was being carried to the home. On examination there was clear evidence of effusion into both knee-joints. The eyes were examined by Mr. A. B. Cridland, who confirmed the presence of papilloedema, the swelling being estimated now at four dioptres. Visual acuity appeared to be definitely affected, though an accurate estimation proved impossible owing to the rapid onset of fatigue.

FURTHER COURSE OF ILLNESS

The pain in the knees had completely disappeared on Dec. 19th, but the amount of fluid in the joints was greater, and by the next day a patellar tap could easily be obtained in both knees, the joints being visibly distended by a considerable effusion. After Dec. 20th the fluid gradually absorbed, leaving lineæ albicantes behind as evidence of the severity of the effusion. No other joints were affected. The headache was severe and there was now some retraction of the head, though of slight degree. These symptoms were eased by a hypertonic enema, and on Dec. 19th a lumbar puncture was done by Mr. C. V. Patrick. The cerebro-spinal fluid was under great pressure, but normal. As the lumbar puncture had eased the headache considerably, it was repeated on Dec. 21st, when the pressure was found to be much less. After this the headaches disappeared and did not return. The eye condition remained stationary for 48 hours after admission, and then slowly improved. In spite, however, of the rapid amelioration in all her symptoms, the patient's temperature remained raised, fluctuating between 99° and 101° F. The only symptom that could now be discovered was some tenderness on deep pressure in the extreme lower part of the right iliac fossa. She constantly said that she was getting no more pain there than she had for some time been accustomed to, but on deep pressure Mr. Patrick was able to feel a resistance suggesting an inflammatory mass.

In view of her previous gynæcological history, she was seen by Mr. Maslen Jones, who found a large retroverted uterus fixed down by inflammatory adhesions. During the next few days the temperature rose to 103° F. at night, and a further blood count on Jan. 5th, 1932, showed 28,000 white cells, with the same differential count as before. The presence of pus seemed certain, and though the local signs were very scanty, an exploratory operation was decided on. An attempt to tap a source of pus in the pelvic connective tissue proving unsuccessful, the abdomen was opened and an abscess was found, lying partly in the pelvis and partly in the right iliac fossa. The abscess cavity was contained within loops of bowel, being shut off by adhesions from the rest of the peritoneal cavity. The pus from the abscess gave a pure culture of a hæmolytic streptococcus. The wound was drained and after this she made a slow but steady recovery. The papilloedema slowly subsided and, when examined again in April, the fundi had returned to normal and there was full recovery of visual acuity.

DISCUSSION

It is tempting to associate together the effusions into the meninges and the joints, but a search of the literature has revealed singularly few cases of a similar nature, though a few observations have been made on the development of serous meningitis in the course of serum sickness. Mason [1] reports three such cases.

Case 1 was that of a man of 25 who developed severe serum sickness after the intravenous injection of anti-pneumococcal serum. Generalised urticaria persisted for two weeks, and ten days after its onset he became very drowsy, with evidence of an early papillœdema which in the course of the next five days attained a swelling of one dioptre. The cerebro-spinal fluid was clear and under pressure (not measured). The globulin test was strongly positive, and the fluid contained 15 lymphocytes per c.mm. He improved rapidly after the lumbar puncture, and the fundi gradually returned to normal.

Case 2 was that of a child with cerebro-spinal meningitis who, in the course of the serum sickness after the use of antimeningococcal serum, developed a mild bilateral papillœdema which soon subsided. (This case is open to the objection that the papillœdema may have been a result of the original meningitis.)

Case 3 was that of a woman of 38 who received 300 c.cm. of type 1 pneumococcus serum for pneumonia. The fundi were observed daily. At the height of the serum sickness which followed she developed ophthalmoscopic signs of a mild papillœdema. The cerebro-spinal fluid contained 12 cells per c.mm. and a "heavy trace" of globulin.

Foster Kennedy [2] reports the case of a boy who was given serum as a prophylaxis against scarlet fever. A severe bout of serum sickness followed and, in addition to the urticaria, there was severe headache from the start, accompanied by head retraction and a meningeal cry. On the third day of the serum sickness, in addition to other evidence of central damage, a bilateral papillœdema "of great severity" was found. The cerebro-spinal fluid was under great pressure, and contained 14 lymphocytes per c.mm. Following this procedure there was a gradual recession of symptoms and four and a half weeks later he was found to be normal. Kennedy attributed the symptoms to an urticarial œdema of the meninges and the perineural tissues.

In another paper [3] on cerebral symptoms induced by angioneurotic œdema, Kennedy describes the case of a girl, aged 2, the subject of giant urticaria, who at times had attacks of severe headache, screaming, and head retraction, followed within 24 hours by generalised urticaria. The cerebro-spinal fluid in the attacks was normal but under greatly increased pressure. Sensitisation tests showed her to be sensitive to milk, and abstention from this had kept her free from both urticarial and meningeal symptoms for 17 months.

De Lavergne and Abel [4] investigated the changes in the cerebro-spinal fluid during serum sickness, the material chosen being cases where serum had been given for prophylactic purposes. They found that there was usually a lymphocytosis of from 5 to 28 cells, and though hypertension was not found in all the cases it was present in some to a marked degree, the reaction usually running parallel with the degree of urticaria.

In his original description of serous meningitis Quincke [5] spoke of it as an angioneurotic hydrocephalus and compared it with effusions into joints. These cases demonstrate the correctness of his insight, as they show that a temporary hydrocephalus can be part of a general reaction in certain cases of serum sickness, the allergic origin of which as a response to foreign protein is undoubted. Although the exact mechanism of such an allergic hydrocephalus is obscure, its clinical importance is probably great. The occasional presence of meningeal symptoms due to intestinal worms is presumably a similar phenomenon. Laurent [6] reports a typical case of serous meningitis due to threadworms, in which the cerebro-spinal fluid was clear, sterile, and under great pressure. Though there is no mention of papillœdema in his paper there can be no doubt that there was a severe degree of serous hydrocephalus which was immediately relieved by the passage of threadworms. The phenomenon is well known, and in view of the other allergic manifestations which can accompany this condition—e.g., urticaria—it is probable that the mechanism of the serous meningitis in these cases is the same as in cases of serum sickness.

In the present instance, the presence of a wandering hydrarthrosis suggested that the papillœdema was due to a similar mechanism, acting presumably on the choroid plexus. While there are many reports on cases of serous meningitis arising in response to an infection elsewhere (as in "otitic hydrocephalus" Symonds [7]), the only example that could be found in the literature in which a serous meningitis was associated with hydrarthrosis is one reported by Warrington.[8] This (Case 3) was that of a man of 34 who was admitted with intense headaches and attacks of vomiting, accompanied by papillœdema. Lumbar puncture gave a clear fluid under pressure. A month later an effusion developed in the right knee-joint, but both this and the headache disappeared while he was taking salicylate. He died four years later of typhoid, and at the autopsy the brain and the meninges were found to be normal, with no evidence of hydrocephalus.

In another of his cases (Case 1) Warrington thought that the rheumatic toxin was the cause. A young boy was admitted with typical serous meningitis (the cerebro-spinal fluid being normal but under considerable pressure) which subsided in the course of a week, but a few months later the boy was admitted with typical erythema nodosum. As a result of his experience, Warrington concludes "that the primary cause of a serous infection is commonly a near or distant focus of infection; the toxins formed by this, but not the actual organisms, stimulate the vessels of the meninges, brain, or ependyma or choroid plexuses to the formation of excessive fluid." In view of the fact that a serous hydrocephalus may arise as part of the general allergic reaction to the injection of foreign protein, it is likely that such cases as those reported by Warrington and the present one may also be based on an allergic mechanism. The immediate mechanism, however, of the increase in the amount of cerebro-spinal fluid remains obscure.

In this case, a generalised rash, joint effusions, and a serous meningitis developed eight days after the onset of an acute tonsillitis. In view of the fact that the illness was ended by the formation of a peritoneal abscess due to a hæmolytic streptococcus, it is likely that this organism was responsible for the original tonsillitis though, as the patient would not allow her tonsils to be removed, a culture from their interior could not be obtained. In any case, the degree of leucocytosis when the patient was first seen suggests that the peritoneal abscess may have been developing even then, and it may well have been the focus from which was derived the streptococcal toxin that is assumed to have given rise to the allergic symptoms. These may have been due merely to a direct toxic action on the synoviæ and the choroid plexus, but if so, it is not a common association, and the demonstration of the possibility of serous hydrocephalus resulting from such an allergic state as serum sickness justifies one in extending this conception to cover the events of the present case. It is suggested that, as a result of previous attacks of

tonsillitis, the patient had become sensitised to a streptococcal toxin and that the rash, joint effusions, and serous hydrocephalus, which followed after the usual period of about eight days, were in the nature of an allergic reaction.

REFERENCES

1. Mason, V. R.: Jour. Amer. Med. Assoc., 1922, lxxviii., 88.
2. Kennedy, Foster: Amer. Jour. Med. Sci., 1929, clxxvii., 555.
3. ,, ,, : Arch. Neurol. Psychiat., 1926, xv., 28.
4. de Lavergne, V., and Abel, E.: Bull. et mém. Soc. Méd. Hôp. de Paris, 1926, l., 488.
5. Quincke, H.: Deut. Zeits. f. Nervenheilk., 1897, ix., 149.
6. Laurent, L. J. M: Brit. Jour. Child. Dis., 1931, xxviii., 296.
7. Symonds, C. P.: Brain, 1931, liv., 55.
8. Warrington, W. B.: Quart. Jour. Med., 1913–14, vii., 93.

A CASE OF ERYTHRÆMIA

WITH JAUNDICE, HEPATIC CIRRHOSIS, AND HÆMATEMESIS

REMARKS ON ERYTHRÆMIA AND ERYTHROLEUKÆMIA

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In 1929, when I demonstrated this case at the clinical section of the Royal Society of Medicine, the following was a résumé of the history and clinical observations up to date[1]:—

HISTORY UP TO NOVEMBER, 1929

The patient, a Welsh woman, married, aged 40 years, living near London, has a typical "erythræmic" appearance and is markedly jaundiced. Height, 152·4 cm.; weight, 71·6 kg. in May, and about 1·5 kg. more in October, 1929. There is decided excess of subcutaneous fat over the thighs, buttocks, and abdomen. Examination of the thorax shows nothing special, excepting (by X rays) rather excessive bronchial markings and very slight enlargement of the aortic arch.

The spleen is enlarged and feels rather firm, the lower edge reaching three finger-breadths below the costal margin. The liver (not abnormally hard) can be palpated three and a half finger-breadths below the ribs in the right nipple line. No ascites. No subcutaneous œdema. Menstruation regular. Bowels not confined. Brachial blood pressure: 165/95 mm. Hg. Urine (Oct. 17th): specific gravity 1011; clear; rather high yellow; acid; a little albumin (moderate "cloud" on boiling); no sugar; excess of urobilin and urobilinogen; no bilirubin; excess of indican; one or two hyaline tube-casts seen in the centrifuge sediment. Ophthalmoscopic examination shows a typically "erythræmic fundus." Basal metabolism (two estimations): 127 per cent.

A blood count on April 29th showed:—

Erythrocytes ..	7,880,000	Polymorph.	70%
Leucocytes ..	16,350	Basophil	3%
Hæmoglobin ..	120%	Eosinophil	3%
Colour-index ..	0·76	Lymphocytes ..	21%
Thrombocytes ..	1,512,960	Monocytes	3%

No nucleated or abnormal red cells seen.

The blood-serum gives an extremely strong positive indirect Hijmans van den Bergh reaction for "blood bilirubin." The resistance of the washed erythrocytes towards graduated hypotonic sodium chloride solutions seems to be within normal limits, hæmolysis commencing with the 0·5 per cent. solution and becoming complete with the 0·32 per cent. solution. The blood-serum gives negative Wassermann and Meinicke reactions. Blood-serum cholesterol: 190 mg. per 100 c.cm. A recent blood count (Oct. 17th) showed decided increase in the polycythæmia; hæmoglobin, 125 per cent.; erythrocytes, 8,900,000; colour-index = 0·7; leucocytes, 18,650. The erythrocyte count still more recently (Nov. 7th) was 10,100,000.

The patient was married at 21 years of age and has had three children (all living and healthy); no miscarriages. There is nothing special in her family history. She is said to have had typhoid fever in childhood. Her first attack of jaundice was eight or nine years ago, and since then she has had many icteric exacerbations, but of late seems never to have become quite free from jaundice. She began to suffer from vertigo 12 years ago and the giddiness is worse during the exacerbations of jaundice. The attacks of giddiness come on especially when she is walking in the open air, and during a recent attack she fell and cut her forehead (Oct. 15th). For a long time she has been subject to occasional attacks of pain in the left lumbar region, passing down the outer part of the left thigh, but she has had no attack suggesting biliary colic. She suffers from occasional epistaxis and often has severe headaches. It was five years ago that she first noticed that her face had become redder and that she flushed very easily. She has been relieved by blood-letting.

FURTHER PROGRESS

After November, 1929, I employed blood-letting, with some cautious trials of phenylhydrazine. However, the chief treatment was automatic on the patient's part, by two extremely severe attacks of spontaneous hæmatemesis, the first in January, 1930, the second in January, 1931. From the effects of the latter hæmorrhage the patient never completely recovered, as if there were some exhaustion of the hæmopoietic function of her bone-marrow. In September, 1931, she was pale and slightly jaundiced, but stated that with this sallow appearance she felt much better and more comfortable than she did when she looked full of blood ("erythræmic"). Her spleen reached four finger-breadths, and the liver (in the right nipple line) reached two finger-breadths below the costal region. Her blood count on August 29th, 1931, was:—

Erythrocytes ..	5,400,000	Polymorph.	69%
Leucocytes ..	32,800	Eosinophil	5%
Hæmoglobin ..	45%	Lymphocytes ..	18%
Colour-index ..	0·417	Monocytes	1%
		Metamyelocytes ..	7%

No nucleated red cells; some anisocytosis and slight poikilocytosis.

The thrombocyte count, as estimated on May 16th, was 1,678,320 per c.mm. of blood. Fractional examination of the gastric contents (Oct. 13th, and again Oct. 24th, 1931) showed complete achlorhydria, even after a subcutaneous histamine injection; pepsin present. By careful roentgen ray examination no evidence of any gastric or duodenal ulcer or of any neoplasm could be detected, and the dangerous hæmorrhage might have been from gastric or œsophageal varices. It was further possible that the enlarged liver was cirrhotic, though gastric and œsophageal varices doubtless occur without hepatic cirrhosis.

The last paragraph brings the history up to November, 1931. On Jan. 16th, 1932, her blood count was: hæmoglobin, 47 per cent.; erythrocytes, 5,400,000; colour-index = 0·4; leucocytes, 34,300. Brachial blood pressure: 115/70 mm. Hg. The liver could not be felt; the spleen reached four finger-breadths below the costal margin. The urine contained excess of urobilinogen; no bilirubin. On April 23rd, 1932, the sclerotics showed a slight icteric tinge and the blood-serum gave a slightly too positive indirect Hijmans van den Bergh reaction. The lower edge of the liver could be felt just below the costal margin. The urine showed slight excess of urobilinogen, but not of urobilin. Fractional examination of the gastric contents showed the presence of free hydrochloric acid (up to ten) even without the subcutaneous injection of histamine. On June 4th, 1932, the liver was again felt reaching just below the ribs, possibly too hard; the spleen reached three finger-breadths below the ribs. Blood count: hæmoglobin, 54 per cent.; erythrocytes, 5,700,000; colour-index = 0·47; leucocytes, 38,000. The patient said that during the last year she had had hardly any menstrual loss. Brachial blood pressure: 115/70 mm. Hg.

On the night of 19th–20th July, 1932, the patient had another attack of severe hæmatemesis. In the middle of the night, 23rd–24th July, she was brought in an ambulance to the German Hospital in an extremely anæmic and semi-conscious condition and died an hour afterwards.

NECROPSY

The coroner had a post-mortem examination made by Dr. W. J. O'Donovan, who kindly allowed me to remove various pieces for microscopical examination. The body was rather fat and all the viscera were anæmic. The stomach contained a great deal of blood and there was likewise a little blood in the pharynx and œsophagus. No dilated veins or ulceration were at first sight seen in the stomach or lower part of the œsophagus, but after the stomach had been

hardened in formalin a small superficial ulcer was detected. The spleen (weight 2¼ lb.) was much enlarged and adherent to surrounding parts. The liver (weight 4 lb.) showed macroscopically and microscopically a fine cirrhotic change. There was no evidence of any cholelithiasis. The kidneys were of ordinary size, rather pale, and microscopically showed a degenerative appearance in the convoluted tubules. The bone-marrow in the femur was pinkish and microscopically there was absence of fat-vesicles; apart from the erythrocytes, a large proportion of the cells were apparently myelocytes, many of them eosinophilic. The spleen microscopically showed much fibrous tissue, the Malpighian follicles being relatively decreased.

REMARKS

The immediate cause of death in this case was severe hæmatemesis, either from a small superficial gastric ulcer or from gastrostaxis. Hepatic cirrhosis is an acknowledged, though rare, complication of erythræmia. E. Levi [2] has discussed the causation of hepatic cirrhosis in erythræmic cases, with and without phenylhydrazine treatment. Phenylhydrazine in the present case was used at one time, but very little and with great caution. For further discussion on the occasional association of hepatic cirrhosis with polycythæmia (whether true erythræmia or not) see Uhlhorn.[3]

It is noteworthy that at one time fractional examination of the patient's gastric contents showed complete achlorhydria (Oct. 13th and 24th, 1931). I know of only one other case of erythræmia in which achlorhydria was recorded—namely, in the case of a miner, aged 52 years, under the care of the late Prof. G. A. Gibson of Edinburgh.[4]

I take it that the extremely low colour-index in the present case in 1931 and 1932 was the expression of a *relative* secondary anæmia, after severe hæmorrhage in an erythræmic patient. In regard to the persistent high leucocyte counts in this and many erythræmic cases, I would express my views as follows: I have regarded erythræmia as a syndrome caused by a primary neoplastic condition in the erythroblastic portion of the bone-marrow, analogous to myelosis (myeloid leukæmia) in the leucoblastic portion, but non-malignant. It has, however, gradually become clear that if this view is correct the high leucocyte count (chiefly due to excess of the polymorphonuclear neutrophils) found in many or most cases of erythræmia (the leucocyte count is not rarely 20,000 to 30,000) must signify that the non-malignant neoplastic condition of the erythroblastic portion of the bone-marrow is accompanied by a corresponding non-malignant neoplastic condition of the leucoblastic portion of the bone-marrow. Such cases are, in fact, examples of what might be termed non-malignant erythroleukæmia. The very rare supervention in such cases of true myelosis (myeloid leukæmia) appears, therefore, to signify that the non-malignant leucoblastic factor of the erythroleukæmia syndrome has taken on the malignant neoplastic character of full-blown myeloid leukæmia, whereas at first it corresponded to the (very rare) so-called polymorphonuclear neutrophil variety or stage of myeloid leukæmia. Why does the erythroblastic factor never manifest an analogous malignant transformation?

Erythræmic *splenomegaly* seems to be mainly connected with the blood-reservoir function of the spleen. In rare cases of *true* erythræmia (and of course in all cases of Giesböck's "polycythæmia hypertonica"), especially in patients who are not of the usual lean type, there may be no obvious splenomegaly.

In regard to the *diagnosis* of atypical forms of erythræmia the occasional occurrence of what might be termed "symptomatic" splenomegalic polycythæmia should be kept in mind. Thus polycythæmia occasionally accompanies the splenomegaly of splenic tuberculosis and the splenomegaly of obstructive conditions in the portal and hepatic veins (including probably the very rare "Chiari's disease") and the splenomegaly of obscure cases incorrectly supposed to be cases of "splenic mycosis," or resembling splenic anæmia or Banti's disease (but with polycythæmia instead of anæmia).

Amongst the *complications of erythræmia* which I myself have especially observed are: (1) recurrent gout and tophaceous deposits; (2) uric acid lithiasis (obviously comparable to the similar occasional complication of myeloid leukæmia); (3) hæmaturia; (4) tortuosity of arteries; (5) thrombo-angiitis obliterans of extremities; (6) erythromelalgia; (7) hæmatemesis without obvious gastric or duodenal ulcer, though actual ulceration undoubtedly sometimes occurs; (8) attacks of sudden or subacute cardiac incompetence; (9) hepatic cirrhosis; (10) cerebral strokes, probably of thrombotic origin; (11) psychoses.

REFERENCES

1. Weber, F. P.: Brit. Med. Jour., 1929, ii., 892.
2. Levi, E.: Zeit. f. klin. Med., 1924, c., 777.
3. Uhlhorn, E.: Klin. Woch., 1932, xi., 2037.
4. Watson-Wemyss, H. L.: Edin. Med. Jour., 1911, n.s. vi., 125.

Clinical and Laboratory Notes

AN UNUSUAL CONCOMITANT OF ACUTE MASTOIDITIS

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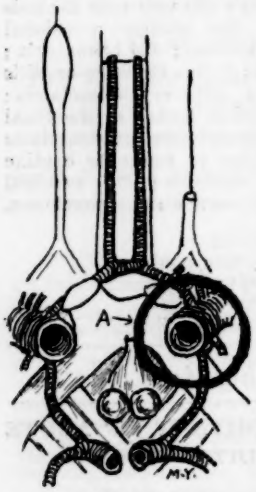
A WOMAN, aged 51, was admitted to the St. James' Hospital on Dec. 3rd, 1932, with a history that she had suffered from a severe cold five weeks before, followed by pain in the left ear. Two weeks later there was a purulent discharge, with pain behind the ear and left frontal region.

On admission her general condition was good. Nothing abnormal was found in chest or abdomen and the throat was clean. There was left otorrhœa, with slight redness and marked tenderness over the tip of the left mastoid. There were no signs of intracranial complication. Temp. 99·8° F., pulse 86, resp. 24.

First operation.—She was seen by the superintendent, Dr. W. L. Maccormac, who explored the mastoid on Dec. 4th and found pus and cheesy-looking material. The antrum and cells were drained in the usual manner. She did well until Dec. 7th, when she vomited and complained of pain referred to the vertex. The pulse-rate and temperature rose, and she became drowsy and mentally confused. One of us (M. Y.) saw her in consultation with Dr. Maccormac at 2 P.M. on Dec. 8th She was obviously very ill, very drowsy, and her mental confusion was marked. The pupils reacted to light and accommodation, and there was coarse horizontal nystagmus on deviation to the left. The exact condition, in the absence of definite guiding signs, was difficult to determine, but meningitis or encephalic abscess appeared probable, and it was agreed that the cranial cavity should be explored without delay.

Second operation.—She was sent immediately to the theatre, where a preliminary lumbar puncture was made. The fluid was not under pressure, was clear and not blood-stained. The patient was evidently very ill and one had to work quickly. Having cleared the cavity of the former

operation, it was enlarged with the gouge, the bone being very hard. No chiselling was done. No obvious lesion of the antro-tympanic roof or in the neighbourhood of the horizontal semicircular canal could be found, and the dura mater was rapidly exposed and incised. The cerebro-spinal fluid that escaped did not appear to be blood-stained, but it became so quickly mixed with blood from the wound that this point could not be definitely decided. There was no bulging of the brain and no well-defined pulsation. The temporo-sphenoidal lobe was explored without result. An attempt was then made to work backwards in order to explore the cerebellum, but the patient's condition became so serious that it was not possible to proceed and she was sent back to the ward. On her return she was very restless, but lapsed into coma during the night. The pulse was small and irregular, the pupils dilated and reacting neither to light nor accommodation, and there was incontinence of urine and fæces. She died at 1 P.M. on Dec. 9th.



A = site of aneurysm.

Cerebro-spinal fluid.—The report upon the fluid obtained by lumbar puncture was: cells, 115 per c.mm.; albumin, 0·25 per cent.; globulin reading, markedly positive. A large number of *Streptococcus longus* was seen in the film and a culture gave a non-hæmolytic *S. longus*.

Post-mortem examination (Dr. Piggot).—On removing the skull-cap and brain a large subarachnoid hæmorrhage was found, the blood clot filling up the interpeduncular space, spreading forwards over the corpus callosum and outwards along both Sylvian fissures. There was an aneurysm about the size of a large marrowfat pea situated at the junction of the left internal carotid, middle, and anterior cerebral arteries (see Figure), pressing upon the left optic tract, with a small rupture on the under surface from which had occurred the hæmorrhage above described. The brain showed no abscess or any gross lesion, and the tracks made by the operative exploration had not reached the lateral ventricle. The fluid in the ventricle was blood-stained. The blood-vessels were degenerated. The other organs of the body were healthy.

REMARKS

(M. Y.).—In many years of active experience of acute mastoid surgery and its complications, I have never met with a case like the above.

Considering the indentation made by the aneurysm on the left optic tract, the presence of hemianopia would have been expected, but no indication of this appears in the notes. That the ear condition was an independent accidental circumstance goes without saying, and its occurrence on the same side as the aneurysm added to the difficulties of diagnosis only when cerebral complication appeared certain. Although aneurysms of this nature are not uncommon, I have never yet personally encountered one as a concomitant of mastoid surgery, nor have I met with any account of one in the literature. The question which arises most prominently in the case here described is that of the time at which the hæmorrhage commenced. From the unstained character of the fluid obtained by lumbar puncture just before the cranial operation, combined with the absence of any symptom of subarachnoid hæmorrhage at the consultation immediately preceding and the patient's restlessness before she became comatose suggests that rupture of the aneurysm took place after the return to the ward. On the other hand: (1) there may have been small and intermittent leakages about the time the patient became drowsy and mentally confused; or (2) rupture may have taken place during her removal to the theatre, or when she was on the table during the induction of anæsthesia. It is not possible to say whether the cerebro-spinal fluid which escaped on incising the dura mater was clear or not because of its immediate admixture with blood from the wound cavity. One cannot be dogmatic upon one symptom and, personally, I do not think it possible to decide with certainty when the bleeding began.

(A. P. P.).—Such aneurysms of the vessels at the base of the brain are not uncommon and may be met with in three distinct types: (*a*) *congenital*, very small in size and situated at the angle of junction of two vessels—absence of the muscular coat has been noted at the junction; (*b*) *embolic*; (*c*) *arterio-sclerotic*, of variable size. In some cases pressure symptoms may be present, the motor nerves to the eyes being most often involved. In the majority of cases the first intimation of the presence of an intracranial aneurysm is the occurrence of a subarachnoid hæmorrhage following rupture.

MONGOLISM IN TWINS

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I PROPOSE to report a fresh case of Mongolism in both of twins, and briefly to review the literature on Mongol twins with its bearing on the ætiology of this form of idiocy.

Mrs. R., aged 39, 3-para., was admitted to University College Hospital for mitral stenosis and twin pregnancy in January, 1932. Her Wassermann reaction was negative. She was discharged after rest and readmitted in labour on July 16th.

The twins, both female, were born as normal vertex presentations. There was no hydramnios. The birth weights were 2690 g. each—head circumferences 12½ and 13 in., brachycephalic in shape. Mongoloid stigmata—viz., epicanthus, muscular hypotonia, protruding tongues, and incurving of the little fingers were present in both from birth.

The placenta, which was single and showed two complete fœtal sacs (chorion and amnion), was injected through the cords with barium sulphate. By this means no anastomosis whatever could be demonstrated in stereoscopic X ray photographs. The twins are, therefore, by the usually accepted criteria binovular. They have since been kept under observation and pronounced by Dr. W. J. Pearson to be undoubtedly Mongol idiots. One has since died of enteritis at the age of 5 months, but the other is still well though obviously idiotic.

The importance of this case lies in that when Mongolism occurs in twins by far the commonest type is where one twin is a Mongol and one normal. I have seen two such cases in U.C.H. Obstetric Hospital, and have collected 34 more (omitting doubtful cases such as those of Fraser and Mitchell[1]). These are here summarised, and include the cases of Harbertsma, Bauer, Orel, and others. Probably other cases occur and have escaped record.

Twins of different sex—i.e., binovular ..	17 cases.
Twins of same sex (uniovular 6, binovular 3, doubtful 7)	16 ,,

The frequency of this type of incidence—i.e., where one infant is a Mongol and the other normal—has led to widespread belief that Mongolism is in some way due to germinal defect. Thus, Harbertsma,[2] Waring,[5] and others have put forward this fact as

evidence to support their conviction that Mongolism was a defect innate in the germ-plasm. This theory would on the face of it seem rational, since if Mongolism were due to some form of maternal debility or abnormal environment of the ovum (the "exogene Ursache" of Orel,[4] and others) the common type would be where both twins are Mongols. Actually this is extremely rare. It is true that at the time when Fraser and Mitchell [1] wrote about their "Kalmuc Idiots" these were thought to be due to maternal exhaustion, since they often came at the end of a family. More recent analysis, however, has shown that this is not true. Brousseau,[6] out of 800 cases, found that 24 per cent. were first-borns and 57 per cent. the first, second, or third child. This high incidence in first children has been confirmed by Reuben and Klein.[7] Harbertsma, it is true, was aware of two cases of Mongolism in both of twins reported by Hjorth and de Bruin, but the twins were of the same sex, and hence assumed to be uniovular, so that his theory of germinal defect was in no way upset. Even by the time Brousseau had written her excellent study of Mongolism only five cases of this type (both twins, Mongols) had been reported. Each pair of twins were of the same sex, and, therefore, were regarded as being ipso facto uniovular (monozygotic). These with two more cases including our own form the Table which follows:—

Both Twins, Mongols

De Bruin: Quoted by Harbertsma [2] ..	MM
Hjorth: ,, ,, ..	FF
Strauch [10]: Jour. of Amer. Med. Assoc., 1923, lxxxi., 2181	MM
Brükner: Quoted by Orel [4]	FF
Reuben and Klein [7]	MM
Bauer [3]	FF
Dikey: Quoted by Bauer [3]	? sex
Russell	FF

Bearing in mind the rarity of Mongol idiocy, the chances seem infinitesimally slight that two ova should become simultaneously fertilised out of the large number which ovulate during a woman's child-bearing life, and both bear this hypothetical germinal defect. Yet our own case is undoubtedly one of binovular twins. The coincidence is, of course, possible but seems to stretch credulity in the "germinal theory" to its utmost, particularly as it now seems quite possible that the few other recorded cases may also have been binovular, for none appears to have been properly investigated. This, of course, is surmise, but the existence of binovular twins, both Mongols, makes it seem unlikely that the cause of Mongolism is any more "innate in the germ-plasm" than due to maternal causes or abnormal environment of the ova. Indeed, one fact seems to stand out from the prodigious literature on Mongolism—that no single ætiological factor can stand the test of being applied to all cases. Of all the "causes" suggested, syphilis,[8] maternal exhaustion, atavism,[9] germ-plasm defect, neuropathic familial taint, all may be said to be "not proven." The condition seems to be a summation of physical and mental defects, which, present in varying degree, may produce anything from an intelligent child with mongoloid stigmata to a Mongol idiot.

These interesting cases of Mongol twins deserve further investigation.

SUMMARY

1. A new case of binovular twins, both Mongols, is described.

2. The theories of ætiology, especially that of "germ-plasm defect," are discussed and shown to be unsatisfactory.

REFERENCES

1. Fraser: Jour. Ment. Sci., 1877.
2. Harbertsma, T.: Amer. Jour. Dis. Child., 1923, xxv., 350.
3. Bauer, E.: Arch. f. Kinderh., 1930, xc., 169.
4. Orel, H.: Zeits. f. Kinderh., 1926, xlii., 440.
5. Waring, J. I.: Amer. Jour. Dis. Child., 1931, xli., 351.
6. Brousseau, K.: Mongolism. Baltimore: Williams and Wilkins, 1925.
7. Reuben and Klein: Arch. Pediat., 1926, xlii., 552.
8. Goddard, H. H.: Jour. Amer. Med. Assoc., 1924, lxxxii., 1196.
9. Crookshank, F. G.: The Mongol in our Midst. London: Kegan Paul, 1931.
10. Strauch, J.: Jour. Amer. Med. Assoc., 1923, lxxxi., 218.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF SURGERY

AT a meeting of this section on April 5th Mr. HUGH LETT, the president, took the chair, and a paper on

Diaphragmatic Hernia

was read by Mr. T. P. DUNHILL. He began by distinguishing betweeen true diaphragmatic hernia and the condition of short œsophagus with thoracic stomach. Some writers on the subject, he said, had not made this distinction, but it was an important one. He had himself seen and operated on five cases of diaphragmatic hernia, and had seen seven cases of short œsophagus in which the stomach was, to varying degrees, intrathoracic. The reported cases of diaphragmatic hernia were very few in number, and most of them came from the American clinics, Hedblom having reported 19 and Harrington 30. It was rare for more than one case to occur in the practice of any individual surgeon and it was therefore important that single cases should be reported.

Mr. Dunhill gave a brief description of his own cases, illustrating the clinical histories with radiograms taken before and after operation. The symptoms might go back over several years, but tended to recur in attacks of increasing severity. There was usually some type of discomfort after food, possibly amounting to actual pain and vomiting, possibly only to a flatulent distension. Sometimes the symptoms resembled those of gall-stones and the difficulties of diagnosis had been increased in two of his cases by the actual presence of gall-stones as a complication. Between attacks the hernial contents in some cases undoubtedly returned to the abdomen, and there was a danger that, at operation, some concurrent condition, such as gall-stones, might be blamed for the symptoms, the hernia being missed. This had almost certainly happened in one of his cases, in which, after the removal of gall-stones at a previous operation, the attacks had recurred, and were found to be due to diaphragmatic hernia. Other symptoms noticed in his cases were hæmatemesis and asthmatic attacks. The visceral contents of the hernial sacs varied within wide limits; there might be stomach only, or a large part of the small or large intestine might be in the thorax. Operation was usually very successful, but one of the five cases in this series had ended fatally, the patient dying on the tenth day of a pulmonary embolism. In another case some of the symptoms had returned after cure of the hernia, and radiography gave definite evidence of a gastric ulcer. The actual site of the hernia varied. One of the largest was a retroxiphoid hernia; others occurred through the œsophageal

orifice or through the cupola of the diaphragm. Mr. Dunhill favoured operation by the thoracic route, with repair of the hole in the diaphragm from above, but he had found in practice that it was impossible to control the hernial contents without an abdominal incision to allow of the assistant retaining the viscera in the abdomen. Collapse of the lung before operation was of great assistance to the surgeon.

The condition known as thoracic stomach was present from birth, but the symptoms were definitely progressive, more and more of the stomach lying above the diaphragm as time went on until the symptoms became extremely troublesome and life was endangered to such a degree that the death-rate was higher without than with operation. These patients were sent into hospital with a variety of diagnoses. Some were labelled carcinoma of the œsophagus, some gastric ulcer; others again showed asthmatic attacks as the chief feature, while in one type of case the only obvious symptom might be a severe anæmia due to hæmorrhage, obvious or occult, produced by a compression of the gastric veins. Oppression in the left side of the chest or pain radiating along the left side of the chest wall was a marked feature in some cases. Mr. Dunhill showed a series of radiograms demonstrating an increasing amount of stomach in the thorax and also the stenosis that tends to occur at the lower end of the short œsophagus—sometimes a true stenosis and sometimes a type of cardiospasm.

Mr. W. SALISBURY described a case of diaphragmatic hernia which he had treated. The patient had had several attacks of pain with intervals of complete freedom. The final attack that brought him to operation occurred during convalescence from an operation for the cure of a double inguinal hernia. The diaphragmatic hernia was through the left cupola and the sac contained a very large stomach and duodenum, a large part of the small intestine, the spleen, the tail of the pancreas, the transverse colon, and omentum. Operation was followed by complete relief of symptoms.

Prof. L. FINDLAY expressed a doubt whether the diagnosis of intrathoracic stomach might not be due to a misinterpretation of the radiographic findings. There was an obstruction present, but he was not willing to admit that it was at the cardia. Why should the cardia always be stenosed when it was in the thorax? The so-called stomach below the obstruction might be dilated lower end of œsophagus, with, in some cases, a metaplasia of the mucosa to the gastric type.

Mr. ARTHUR EDMUNDS gave a cinematograph demonstration of the operation designed by him for the cure of hypospadias.

REVIEWS AND NOTICES OF BOOKS

Clinical Physiology of the Eye

By FRANCIS HEED ADLER, M.A., M.D., F.A.C.S., Instructor in Physiology and Ophthalmology, Medical School, University of Pennsylvania; Assistant Surgeon, Wills Hospital. London: Macmillan and Co., Ltd. 1933. Pp. 406. 25*s*.

THE physiology of the eye is so far from being a developed science that there is hardly any section of the subject on which opinion is agreed. It is thus impossible to compile a text-book on the subject which shall be adequate in the sense that a good text-book of anatomy is adequate. No such text-book has in fact been attempted. But a book like this one of Dr. Adler's cannot fail to be of service to the student of ophthalmology in that it maps out the ground to be covered, and helps him to focus attention on problems which will have to be solved before a complete understanding of various pathological conditions can be achieved. Dr. Adler is only dogmatic on those few aspects of the subject of which our knowledge justifies this attitude. Elsewhere the main theories are stated fairly, while a bibliography at the end of each chapter supplies copious references to original sources.

The first chapter deals with the protective mechanism of the eye, and here we find a truth stated which is so elementary that the student is often left to discover it for himself without pausing to ask for its explanation—namely, that the normal cornea is permeable to watery solutions from without inwards but not from within outwards. The phenomenon has only recently been proved to be dependent on the integrity of the epithelial and endothelial cells. An important factor in the protective mechanism of the eye is the existence of a substance in the tears which is capable of destroying most bacteria—lysozyme. This, too, has only been discovered in recent years. The physiology of the pupil has been pretty well worked out; not so the mechanism of accommodation. Opinion is not even yet unanimous as to whether the act of accommodation involves a slackening of the zonular fibres of the lens according to the theory of Helmholtz, or their tightening according to the theory of Tscherning. Certainly the former theory needs supplementing, and this has only been attempted first by E. F. Fincham, who drew attention to the part played by the lens capsule, and then by Thomson Henderson, who believes that the different portions of the ciliary muscle have different functions and that the act of accommodation is effected by the combined contraction of its circular fibres, which act as a sphincter, and the relaxation of its longitudinal and radial fibres which, when they are in a state of tonic contraction, maintain the pull on the zonule which keeps the lens capsule taut. Except this book we know of none in which Henderson's theory is clearly explained; and even so the student would be well advised to consult his original papers.[1] The chapter on the lens and vitreous is concerned largely with problems of biochemistry, the growth of which may be gauged from the bibliography of over one hundred recent articles.

Concerning the visual pathways in the brain and the relation between the different parts of the visual fields and the arrangement of fibres in the optic nerves and tracts it is possible to be fairly definite, but when we come to the subjective characteristics of vision we find ourselves in a region of speculation rather than of fact. Even visual acuity has its unsolved problems such as its relation to illumination. The function of visual purple is still unknown. Dark adaptation is not really understood. The Purkinjé phenomenon is very variously interpreted, and as to colour-blindness, its explanation remains just as much in the theoretical stage as it was half a century ago. A good deal of space is devoted to the physiology of the external ocular muscles and problems connected with binocular vision, and arguments are adduced tending to make Worth's hypothesis of an actual centre in the brain for the "fusion sense"

[1] Trans. Ophth. Soc., 1911, xxxi., 247; ibid., 1926, xlvi., 280.

superfluous. The last two chapters deal with the formation of the aqueous humour and with intra-ocular pressure, both of them subjects with a direct bearing on ocular pathology, about which there has been much controversy. The whole book is in truth what it professes to be—an introduction to various physiological problems connected with the eye.

Individual Psychology and Practice

Individual Psychology Pamphlets Publications. Medical Pamphlets: No. 6. By Drs. ERWIN WEXBERG, OLGA KNOPF, and H. C. SQUIRES; No. 7. By Dr. LEONHARD SEIF, Miss DORIS RAYNER, and FRAU AGNES DE ZILAHI. London: C. W. Daniel and Co. 1932. Pp. 59. 2*s*. 6*d*. each.

THE little pamphlets of the Individual Psychology Group are becoming familiar periodicals in medical psychological literature. Dr. Wexberg's article on individual psychology and psycho-analysis in medical practice is in the first place a criticism of psycho-analytic theory, after the familiar bowing recognition of the importance of Freud. He brings out the distinction that psycho-analysis regards the human mind as an object of nature whereas individual psychology regards the human being as a purposive unity. Whereas psycho-analysis stresses the infantile origin of neurosis and libido fixation, individual psychology stresses the importance of the goal and the subject which strives for this goal. Dr. Wexberg vehemently denies the proposition that individual psychology uses powerful suggestion, but he cannot help adding that the physician "must convince the patient by his own conviction." Fundamentally, individual psychology is of practical value as long as the individual psychologist admits that his approach and his goal is pragmatic. But we are left with a feeling that individual psychology does not accept the realist and scientific approach which has been the cornerstone of the Freudian psychology. Dr. Knopf is much more practical in her exposition and does not indulge in unnecessary dialectic. She demonstrates very clearly the importance of psychological attitude in the production of many gynæcological states which only too often are treated as physical disturbances. Appreciation of the important fact that in this realm, perhaps more than in any other, psychical stimuli and emotional disturbances are capable of producing the most varied disorders and even, eventually, physical changes through their chronicity, may lead to a considerable improvement in the results of treatment.

Dr. Squires gives a novice's impression of the theory and practice of individual psychology. He has admittedly no direct acquaintanceship with psychological medicine, but he gives us very honestly the intelligent practitioner's difficulties when confronted with psychological theory.

Pamphlet No. 7 of the same series contains an article on individual psychology and education, by Leonhard Seif, a leading individual psychologist of Munich, who has recently visited this country. He presents in his article the familiar Adlerian psychology in which social standards, coöperation, and courage are the mainsprings of mental happiness. He stresses Nietzsche's dictum that for education the education of the educator is a sine qua non. Dr. Seif's address is encouraging in its optimism and in its common sense, but he has added nothing to our understanding of the deep mechanisms of mind and the problems of education. The education of the infant, by Agnes de Zilahi, is a very useful document on the reactions of an infant observed by an intelligent mother. While one might dissent from some of her interpretations, her observations are of real value. Psychological medicine can do with many more of these intelligent observations of the everyday responses of children without romantic or recondite interpretations.

Principles of Full Denture Prosthesis

By E. WILFRED FISH, M.D., L.D.S., Dental Surgeon and Lecturer in Dental Prosthesis to the Royal Dental Hospital; and Assistant Dental Surgeon to St. Mary's Hospital. London: John Bale, Sons and Danielsson, Ltd. 1933. Pp. 100. 10*s*. 6*d*.

THE dentist who could solve the problem of the stability of the complete lower denture would be almost as great a benefactor to humanity as the man who makes two blades of corn grow where one grew before. A book which purports to establish the principles which lead to the production of completely satisfactory dentures will be subjected to most searching scrutiny, for the dental profession has had much experience of methods which promise well but fail to implement their promise when tested clinically. This work contains much that is original. Unlike many books on dental prosthesis, it does not depend on involved and highly speculative premises, but on plain anatomical facts. Dr. Fish's contentions seem to be anatomically and physiologically correct. The acid test, however, must be the behaviour of dentures in the mouth, when constructed according to his methods. Experience shows that with some patients dentures constructed in defiance of all anatomical principles are comfortable and efficient, while in others, dentures made scientifically fail dismally. Yet, in the long run the rule-of-thumb method is less likely to be successful than methods which are based on sound principles. The various steps in the construction of full dentures along the lines advocated by Dr. Fish are in themselves simple and involve no special apparatus other than that used by every dentist. Their novelty consists in utilising those muscular activities of the mouth which so often upset the stability of the lower denture, in such a way that they help to stabilise it. Some evidence already exists that dentures constructed according to his technique are remarkably stable, though it may be doubted whether they are suitable for every case. Most books on dental prosthesis are both uninteresting and difficult to read. It is a refreshing contrast to come on a book which is lucid and persuasive. The diagrams and stereoscopic photographs are admirable.

Office Surgery

By FENWICK BEEKMAN, M.D., Visiting Surgeon, Bellevue Hospital; Clinical Professor of Surgery, New York University. London: J. B. Lippincott Company. 1932. Pp. 402. 21*s*.

THIS book which is one of the Everyday Practice series, edited by Dr. Harlow Brooks, sets out to deal with surgery as seen and practised in the surgeon's office or, as we call it, his consulting-room. It hardly fulfils this purpose. As a manual of what is commonly called minor surgery it is sound, practical, and clearly written, and well covers the ground of wounds, injuries (including fractures), and superficial inflammations and neoplasms. With more serious surgical diseases, however, it does not deal, abdominal

and in fact all internal disorders being omitted. Although the larger portion of the book describes the indications for and performance of minor operations only, such subjects as cancer of the breast and other diseases of that organ are discussed in some detail. The scope of the book is therefore not logically defined, since it is neither limited to such operations as can if necessary be performed in the surgeons' office, nor does it cover adequately the wider field of the surgical cases which he will see but not necessarily treat there. The printing, illustrations, and style are admirable, and under a less ambitious title the book could be regarded as a satisfactory exposition of minor surgery.

Cinquante techniques chirurgicales

de Henry Delagenière. By YVES DELAGENIÈRE. Paris: Masson et Cie. 1933. Pp. 316. Fr.50.

THIS interesting book describes the technique arrived at, after long experience, by a great French surgeon. It covers many branches of the art and in the clearest language we read how Henry Delagenière solved some of the numerous problems of surgery. Besides accounts of many common procedures we have here descriptions of such operations as thyroid grafting, section of the glossopharyngeal nerve, ligature of the superior longitudinal sinus for epilepsy, and other less usual methods. Delagenière favoured an abdomino-perineal excision of the rectum of the Coffey type and practised a suprapubic perineal combined operation for malignant enlarged prostate. It is curious that only a short section should be devoted to osteo-periosteal grafts for which Delagenière is famous. Operating surgeons will read this book with profit.

Chronic Rheumatism and the Pre-Rheumatic State

By J. D. HINDLEY-SMITH, M.A. Camb., M.R.C.S., late Clinical Assistant, St. George's Hospital and Victoria Hospital for Children. London: H. K. Lewis and Co., Ltd. 1932. Pp. 154. 5*s.* 6*d.*

IN his preface Dr. Hindley-Smith tells us that his investigation began by the accidental discovery that the treatment required for the cure of certain skin diseases associated with chronic rheumatism was equally effective in curing the accompanying rheumatism. But there is little in the book itself which fulfils the hope thus aroused that the author has something new to tell us. Are we really expected to accept the picture given of the three stages of rheumatism as a typical description? If so, we must consider it a rare disease instead of a common one. What, again, is "a slight soft presystolic murmur"? A presystolic murmur is generally held to be the result of a rheumatic infection of the mitral valve arising from acute rheumatism in childhood. Does the author suggest that the acute rheumatism of childhood is a forerunner of chronic rheumatism of adult life? This is by no means confirmed by clinical experience. The section of this book dealing with treatment will be of value to those who are not familiar with modern methods of treatment of rheumatism. It is a balanced and interesting account, and conveys successfully the idea that one line of attack will not succeed, but that if the disease has been considered from all angles success may be realised by a planned combination of measures according to the symptoms shown.

In his last chapters Dr. Hindley-Smith draws for us an alarming picture with the streptococcus as the villain, and prophesies that "we may wake up to the fact some day in the near future that the nation is becoming immobilised with rheumatism—that not only the elderly and staid but the young and vigorous are unable to continue with their usual occupation and are compelled to give up their time to invalidism and medical treatment." His fears are not shared by the majority of his colleagues. Rheumatism has been always with us and with our ancestors, so much so that till recently it was accepted as an almost inevitable concomitant of advancing age. We are now approaching it with a new enthusiasm which will not be helped by exaggerated language.

CORRIGENDA.—The Oxford University Press point out in reference to the review of the work on Operative Surgery by Dr. Alexander Miles, consulting surgeon to the Edinburgh Infirmary, and Dr. Wilkie, professor of surgery in the University, that the work is not a part of Thomson and Miles's manual but a new book.

REPORTS AND ANALYSES

REID'S STOUT

(STAG BREWERY, PIMLICO, LONDON, S.W.)

THIS sample of Watney, Combe, Reid and Co.'s Special Stout gives on analysis the following results:—

"Original gravity"	1053·1
Alcohol by volume	5·14 per cent.
Equivalent proof spirit	8·95 ,,
Volatile acid (calculated as acetic) ..	0·05 ,,
Fixed acid (calculated as lactic)	0·11 ,,
*Total solid matters in solution (weight / volume)	5·00 ,,

* These include:—

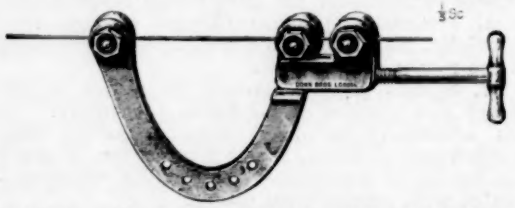
Maltose (malt sugar)	1·35 per cent.
Dextrin	1·95 ,,
Other carbohydrates, hop extract, &c. ..	0·81 ,,
Proteins	0·52 ,,
Lactic acid	0·11 ,,
Mineral or saline matters (ash) (including phosphoric acid 0·068)	0·26 ,,

The popularity of the beverage is accounted for by the flavour and the contents.

NEW INVENTIONS

A MODIFIED KIRSCHNER'S STIRRUP

THE modification of Kirschner's stirrup for use in his system of piano-wire extension of fractures, shown in the illustration, seems to have advantages over some other types of stirrup. The threading of the wire through the stirrup is simple. It is impossible



to twist, and so fracture, the wire while tightening it. After the wire has been tightened it is securely and rigidly held in the stirrup by the end-piece locknuts. The stretcher is detachable, and only one is necessary for any size or number of stirrups, expense being thus reduced. There are two alternative sizes of end-piece nuts and five sizes of stirrup to suit the olecranon, the tibial tubercle, the calcaneus, or the lower end of the femur. In practice, I think, it will be found that two sizes of stirrup will be sufficient.

The instrument has been made for me by Messrs. Down Bros., St. Thomas's-street, London, S.E.

NIGEL A. KINNEAR, M.B., B.Ch. Dub.
Sir Patrick Dun's Hospital, Dublin.

THE LANCET

LONDON: SATURDAY, APRIL 15, 1933

THE CONSULTANT SERVICE OF THE L.C.C.

THE difference of opinion on the conditions of service offered by the London County Council to its consultant and specialist staff have been set out—at least some of them—in our columns by representatives of each body and by individual correspondents, and it is unlikely that either side has made converts to its views. Those who consider that for a consultant or specialist to accept the terms of the L.C.C. amounts to acquiescence in humiliation will not be reconciled to serving the Council by learning that in some respects the terms are those agreed upon by the British Medical Association. Those who regard the action of a consultant's committee in promoting opposition to the Council as unnecessary, while the terms appear satisfactory to many immediately concerned, will not alter their views by learning that others find those terms highly unsatisfactory. And while no common agreement is before the profession these differences of opinion will remain in operation. Prominence in their arguments has been given by the Council and the consultants to the dates on which certain things occurred or on which they were timed to occur, with the result that a want of prevision is revealed on both sides. The Council should have foreseen that time would be wanted for the adjustment of details, and the consultants should have been more prompt in defining that their attitude towards the propriety of service under the Council would be dependent upon the results of a meeting between representatives of the Council and some authoritative spokesmen of their own. Must the Council and the consultants, out of high respect for their own positions, behave as though nothing can be done unless one or other side yields unconditionally? The insistence upon dates only serves to remind us that the clock cannot be put back—a truism which is not true and which we have heard before; and many a train has been missed with the result of a satisfactory journey by a later one.

There are undoubtedly many consultants and specialists ready to work on the terms offered by the L.C.C. and they will not react alike to the opinion of the senior consultants set out in the letter to the *British Medical Journal* and *The Lancet* on April 8th. Men will go different ways, each feeling uncomfortable. Those who join the service will be open to the accusation of disloyalty to their calling, if hard words are to be taken at their face value; and those who do not join, though desiring the posts and repudiating the aspersion of disloyalty, will feel that they have not had the courage of their opinions. This is not the happy atmosphere in which the highest branch of medical work, as conducted in the largest medical service in the world, should commence operations, and we feel that there should be a sinking of animosity. Certainly there have been exhibitions on each side of courtesy, but opposing inflexibilities mean animosity, whatever the protagonists on either side may say to, or of, each other. The situation demands a joint resolve that its difficulties should be solved—now if possible, but at any rate within a brief time, for the public good. That is the good which is desired equally by the Council, as trustees of the public's money, and by the medical profession as guardians of the public's health; and the public good is jeopardised if the success of such an organisation as the consultant and specialist medical service for the London municipal hospitals is not thoroughly assured.

We write before the result can be recorded of a meeting of the Council of the British Medical Association convened for Wednesday in this week, which is to consider the request of Tuesday's meeting of consultants to take action on their behalf, a request made with knowledge of the willingness of the London Voluntary Hospitals Committee to act as mediator. In the meanwhile the plan of immediate withdrawal from the service is abandoned and there is good hope of a year of grace in which to secure "the closest coöperation of all men of goodwill in the hospital field," as desired by Sir CHARLTON BRISCOE and his co-signatories in their letter to the medical journals last week. Sir FREDERICK MENZIES has stated categorically that it would be impossible to alter the proposals of the Council at this stage, but he added that the scheme is for an experimental period of one year during which it would be carefully considered by the Council, when desirable modifications could be made in the light of the experience gained. Dr. ANDERSON has stated, equally categorically, that the consultants and specialists are still anxious to coöperate with the Council in order to secure an efficient and harmoniously working service. It should thus be possible to arrange a year of grace, postponing any withdrawals from the Council's service until April 1st, 1934, when they could be still made effective if in the meantime the differences were found incapable of adjustment. Such a procedure would imply neither an unconditional yielding by the Council to medical dictates, nor a timid resignation by the medical profession to a lay body. It would prove on both sides a real desire to get the best medical service for the public.

THE DAMAGED LUNG IN CHILDHOOD

THOUGH responsibility for the care of children suffering from pulmonary tuberculosis has been undertaken by the State, and lavish provision has been made for their institutional treatment, very little has been done for children suffering from non-tuberculous infections of the lungs. However widespread tuberculous infection may be—and its extent probably varies considerably in different localities and at different times—pulmonary disease due to this cause is rare in England. And when such disease does occur it is usually of benign type, with a tendency to spontaneous recovery, even without the ideal conditions which a children's sanatorium provides. It is curious then that so little attention has been given to the chronic pulmonary catarrhs of early life which are the direct cause of an incalculable sum of disability and suffering, whether manifested as recurrent attacks of winter coughs with the loss of appetite and loss of sleep, malnutrition, and nervous exhaustion which they entail, or associated with permanent damage to the lungs when fibrosis or bronchiectasis have supervened on broncho-pneumonia. The triangular shadows seen in radiograms of the chest behind the heart shadow on the left or across the cardiophrenic angle on the right have been accepted in France as evidence of bronchiectasis since 1927, when E. RIST and his collaborators interpreted them as such, but English and American radiologists have preferred to regard the shadow as due to collapse. The use of lipiodol has cleared up any doubt there was, and the term atelectatic bronchiectasis is being commonly applied to cases with dilatation of the bronchi within such collapsed areas. Beginning with J. V. SPARKS a number of British clinicians have called attention to the occurrence of such a lesion, which R. W. B. ELLIS in a recent paper [1] gives good reason for thinking is more frequent than the literature would imply. He reports eight cases studied in the children's department of the London Hospital during the last two years, five of which showed the classical picture. The point he makes is that atelectatic bronchiectasis is apt to be "silent" or "dry"; that is to say, it may exist for long periods without fœtid sputum or toxæmia. The bronchial dilatation is secondary to collapse, and is attended with retention of secretion which may spill over into adjacent bronchi and cause further extension of the lesion. Treatment consists in re-expanding the collapsed lung if this is still possible—that is to say, before fibrosis has taken place. Silent though it may be, this kind of bronchiectasis is always liable to secondary infection with the rapid appearance of constitutional symptoms, and leading rapidly to a fatal result. The secondary infections are therefore to be avoided at any cost.

[1] Arch. of Dis. in Child., February, 1933, p. 25.

Bronchiectasis is in fact not only one of the most distressing but one of the most fatal forms of disease in early life. It is a pity that the word resembles bronchitis, and is, moreover, difficult to pronounce and hard to remember. If bronchiectasis had some popular designation—for example, "lung-rot"—parents of the class chiefly concerned would realise its gravity and the need for special care, school inspectors might cease to harry mothers who keep coughing children from school at times when their attendance is a danger to themselves and others, and public opinion would spare some of the sympathy lavished on the "consumptive" child and insist that adequate attention should be devoted to an urgent social problem. Cough in childhood should never be lightly regarded. It is a warning which, if neglected, may have as its sequel broncho-pneumonia with its immediate threat to life and its possible legacy of a damaged lung. It must not be supposed that the public health authorities have been entirely neglectful or unmindful of the dangers that beset childhood in a climate peculiarly favourable to pulmonary disease. The dribbling nose has always caught the attention of the school medical inspector, and in an attempt to prevent infection of the upper air-passages from spreading to the lower a system of semi-compulsory adenectomy and tonsillectomy has been established throughout the elementary schools. The result has been disappointing. The dribbling nose is perhaps less frequently seen, but dribbling bronchi remain. This is not perhaps very surprising when we consider that the child who lives in a slum tenement and attends an overcrowded infants' school is constantly receiving massive doses of infection at home and infection only slightly less concentrated abroad. It is too often forgotten that the chronic pulmonary catarrhs are communicable diseases and, though the degree of infectivity may be low, in squalid areas several members of the same family may be affected with bronchiectasis. Overcrowding and bad housing probably play a greater part in the dissemination of these diseases than they do in the spread of tuberculosis.

The child of privilege may be subject to attacks of bronchitis, or fall a prey to broncho-pneumonia, but permanent pulmonary damage—the fibroid lung and bronchiectasis—seldom result. Unless the acute condition proves fatal, complete recovery is the rule where adequate treatment during illness and healthy conditions during convalescence are provided. Where home conditions are unfavourable, a child suffering from broncho-pneumonia should always be treated in hospital. Before discharge is considered a careful physical and radiological examination of the lungs should be made to ensure that resolution is complete. Transfer to a convalescent institution, to precede the child's return to his home, should not be arranged until the lungs are clear. If these precautions are not observed, atelectasis of a lower lobe which might have yielded to timely treatment may become a permanent legacy, to be followed after a shorter or longer interval by

bronchial dilatation, retention of secretions, and chronic suppuration. Once bronchiectasis is established an early death from broncho-pneumonia can only be regarded as a blessing. Few lives are more wretched than those of the victims of this often lingering and always loathsome disease.

LEPROSY AND ITS NATIONAL RELIEF

IN considering the problems of leprosy the public mind has been centred intensively upon the main aspects of a terrible disease—its long course, its offensive and disfiguring character, and the mental anguish which follows in its train. This public reaction is natural, and has already had a valuable outcome, for the stirring of sympathetic interest has been followed by practical support of measures for the relief of a huge misery. The economic position which has resulted has not received, however, the same attention as the misery for the alleviation of which action has been taken.

The British Empire Leprosy Relief Association, which had its origin in the public sympathy evoked, has been struggling to the utmost during the nine years of its existence to stimulate the Governments of our dependencies to face the problems of leprosy, and has endeavoured from meagre resources to give assistance wherever effective measures are being taken to control this scourge. The financial position of this praiseworthy organisation is one of extreme difficulty, and the public support which it should receive is obvious but not forthcoming. In these times of financial stringency all Governments are restricting their contributions in order to balance their own budgets, just as individual subscribers to charitable objects are being driven to scrutinise their bank books. The Association is being requested, constantly and urgently, for further supplies of hydnocarpus oil to treat this disease, sometimes in far-away corners of the Empire, the Association being pledged to combat leprosy wherever it exists. Its efforts operate by the establishment of treatment centres, by the supply of drugs and instruments, by educational propaganda, and by training in the methods of leprosy research. Its organisers feel that they have set their hand to a task which should result in eradicating leprosy from all the lands of the Empire, as effectively as it was eradicated from the home country in the Middle Ages. Although much has already been done, further investigations are required to estimate the prevalence of this disease in the tropical parts of the Empire, and in order effectively to deal with tropical leprosy. It is estimated that an income of at least £15,000 a year is necessary, but during the last working year the income fell short shockingly of this sum, £1460 being received in grants of which £886 was spent in drugs alone. The *Leprosy Review*, assisted by other publications, has consistently recorded the work that is being done, in justification of its support and extension, and such work as that reported by Dr. GARDINER ROSE, the medical superintendent of the Mahaica leprosy hospital in British Guiana forms powerful advocacy.

Dr. ROSE estimates that in British Guiana, with a population of about 200,000, there are some 560 persons alive, who formerly suffered from this disease, whilst careful investigation has shown that approximately 55 young people of all races are freshly infected every year, two-thirds of whom are males. The records of the Mahaica hospital show that from 1913–1925, 83 persons were discharged as being no longer infectious, but all were so mutilated and disfigured as to be unable to support themselves. Instead of playing their part as producers, these poor souls became nothing but an incubus. The leprous subjects cost the colony for their support £10,000 a year, while the combined value of their work, which is lost, must be a considerably larger sum. Lady DENHAM, the wife of the Governor of British Guiana, is making it her special task to protect the children of the colony, and her endeavours have, we are glad to say, received publicity. The position of children in a leper asylum is pathetic. They are generally fit for discharge after a period of two years from the commencement of treatment, but it too often happens that they have no home to go to—their parents may be dead or may be suffering from active signs of the disease. Thus the children may have to remain till they are mature within the bounds of the hospital, where the possibilities of counteracting the disease are greatly diminished and the opportunities for education are inadequate, while the association with a heterogeneous population—from which criminals are by no means absent—combines to deprive them of stimulus or opportunity to play any useful part in life. For children born of leprous parents, as for those whose parents have contracted leprosy subsequently, the rule is separation. In order to save this sad wreckage of human material, Lady DENHAM has set herself the tasks of collecting a substantial sum and of instituting a home to support and educate the native children, 40 to be admitted each year. Such a charitable and practical organisation should give a fresh impetus to the work of eradicating leprosy from the colony in more than one way, for leprous parents who have uninfected children will be far more ready to enter hospital for treatment if they know that their children are well cared for during their absence.

Medical science already owes a considerable debt to the British Empire Leprosy Relief Association and especially to Sir LEONARD ROGERS for having advanced so greatly the scientific treatment of that disease. Not every worker is agreed upon the best methods of administering hydnocarpus oil, yet there is general agreement upon the advantages conferred by this method of treatment, and the results speak for it without contradiction. But the work of eradication is hampered by inadequate resources. And Lady DENHAM'S movement supplies an appealing reason for the gift of money to its support, as well as for a larger interest in the work of the Association as a whole.

ANNOTATIONS

AMERICAN STUDENTS IN FOREIGN MEDICAL SCHOOLS

CONGESTED conditions in the American medical schools, as we have recognised in this country, have led to the migration of students to European centres. Every year lately in the United States a number of students have been refused admission to the schools, the competitive selection being designed to bring the standard in medical training to a high level. The commonest reason for rejection of candidates has been their inadequate premedical education, but undoubtedly race and personality have played their part in the methods of choice. Certain of the rejected students, having betaken themselves to medical centres in Europe, have returned to America with qualifications which have enabled them to pursue their medical training in America without going through the preliminary portals, and this has been considered to lead to a lowering of the American standard, inasmuch as the recipients of these foreign degrees and diplomas have not received, in the opinion of their home authorities, the requisite cultural training. In this country the General Medical Council, dealing with the question from the British point of view, have not found the American immigrants of any high quality, and the unfortunate young men have in a large measure failed to obtain training on this side. Those who have made good their right of entry to our schools and have duly attained their qualifications have hitherto been able to return to America, and without further scrutiny complete their medical training at home. Now, however, the Federation of State Medical Boards sitting in Chicago has recommended the following :—

> That no American student matriculating in a European medical school subsequent to the academic year 1932–1933 will be admitted to any State medical licensing examination who does not, before beginning such medical study, secure from a State board of medical examiners or other competent State authority a certificate, endorsed by the Association of American Medical Colleges or the Council on Medical Education and Hospitals of the American Medical Association, showing that he has met the premedical educational requirements prescribed by the aforementioned association.

The position has evidently caused considerable anxiety in the United States. An article entitled "The Foreign Medical Graduate," published in the *Journal* of the Association of American Medical Colleges in March last, and written by Mr. Harold Rypins, secretary to the Board of Examiners to the State of New York, suggests that there has been already definite damage to the American ideals ; and in the same issue Dr. Zapffe, secretary to the Association, says that the medical schools of America are unlikely to have a shortage of students, the conclusion being that from the numerical point of view there is no reason why the student who has migrated should receive any particular welcome. Among the small number of graduates and diplomates from the British medical schools it is gratifying to learn that the after-result of American examinations is good, but from many of those schools we have heard that during recent years the influx from America, now checked by financial depression, has constituted a difficult problem, and certainly it is one to which the General Medical Council has paid considerable attention. Under the new system it appears that no American student matriculating in a European medical school will be admitted to any State licensing examination unless he can obtain from the State board of medical examiners, or other competent authority, a certificate showing that he has met the premedical educational requirements prescribed by the Association of American Medical Colleges. Further, no student, whether American or European, will be admitted to any State licensing examination unless he can produce satisfactory evidence of premedical education of the prescribed standard, and of graduation from a European medical school after a medical course of at least four years. An interesting phase in the whole question is the action of the faculty of medicine at Basle, which has resolved to demand from American students, as a condition of matriculation, the degree of bachelor of science or bachelor of arts as well as a knowledge of the German language. Should the faculty so determine in a particular case, these students may be given credit for two half years of scientific studies ; examinations in physics, chemistry, and biology passed in America may be recognised for this purpose if the marks obtained in each subject are not less than "satis-bene." Reciprocity in the training of medical students, at any rate between countries of similar cultural standing, was wont to be warmly advocated by medical educationists, but we are clearly receding from this position.

THE NATURE OF ODONTOMES

IN an erudite article [1] on the nature of that group of interesting pathological conditions known as odontomes, Mr. A. T. Pitts suggests a new definition to include all abnormal teeth, as well as tooth tumours occurring outside the jaws :

> "An odontome is an abnormal formation of tissues homologous with the dental tissues in their developmental, pre-eruptive or post-eruptive stages, which occurs usually in the region of the jaws, but may also be found in regions not normally associated with tooth formation."

Such a definition may sound verbose in comparison with that given in the "Report on Odontomes," by D. Gabell, W. W. James, and J. L. Payne, published by the British Dental Association more than twenty years ago, but it is intended to cover a more extensive group of abnormalities. The earlier classification laid no claim to finality. Its authors, indeed, suggested that, with increasing knowledge of the pathology of these abnormalities, some changes were inevitable, and they expressed the hope that a classification based upon ætiology would ultimately be possible. It has always been found difficult to draw a line of demarcation between simple supernumerary teeth, geminated teeth, abnormally shaped teeth, and those abnormalities which have generally been termed odontomes. Some years ago Payne suggested the inclusion of geminated and supernumerary teeth as well as those of a teratomatous type. Pitts appears to accept the view of Prof. G. W. Nicholson, who regards neoplasms as aborted organisms, and thinks that no real distinction can be drawn between true tumours on the one hand, and accessory organs and malformations on the other. He divides odontomes into gnathic and teratomatous, the former including those derived from dental tissues and found in the region of the jaws; the latter those found in other parts of the body. He makes a good point about the cellular origin of odontomes ; it is unreasonable to insist on identifying their origin according to the type of cell present, for we know that the character of the epithelium may change in the course of growth. Pitts is not prepared, therefore, to accept in its entirety the theory of Councell and James that dental cysts arise only as an extension of surface

[1] Brit. Dent. Jour., March 1st, p. 217.

epithelium along a sinus, putting aside the long-held opinion that these cysts are derived from the epithelial debris of Malassez. Dealing with problems which require further investigation Pitts makes a distinction between odontomes that are supernumerary to the normal dentition and those which are aberrations of normal tooth germs, using the term "primary" for those which arise from cells forming the tooth band and "secondary" for those in which the epithelium is given off from the tooth band in the form of enamel organs or from the further proliferation which results in the sheath of Hertwig and its vestiges. He discounts the assumption that odontomes arise merely as aberrations of normal teeth, and he gives evidence in support of the view that in a large number of cases odontomes are additional formations independent of either permanent or deciduous dentition. This point is crucial in determining their ætiology. Another useful suggestion he makes is that whilst the uncalcified odontomes tend to quantitative growth, the calcified odontomes undergo both quantitative and qualitative growth. His paper should advance the day when a classification of odontomes can be based firmly on ætiological factors. It would help if all those who possess specimens of this nature would submit them for microscopical examination.

ULTIMATE PROGNOSIS OF GRAVES'S DISEASE

Dr. A. Engel has followed up [1] 200 cases of Graves's disease treated at the Seraphimerlazarett in Stockholm in the period 1913–1930. Only those cases were included in this study in which the diagnosis of morbus Basedowii was justified on the clinical evidence. The questionnaire addressed to these patients called for answers on such points as continuity of the prescribed treatment after discharge, whether some other treatment such as X ray or operative treatment had been undergone, and, if so, where. The patients were also asked if they were now fit for work, wholly or partially, and if they were not, the reasons therefor. Information about such symptoms as palpitation of the heart and tremor was also requested. This questionnaire yielded information about 192 of the 200 patients—a remarkable achievement in itself, considering that the patients came from every quarter of Sweden—and the 18 tables provide a considered summary of the results. But the findings are not so much in favour of one line of treatment in preference to all others as of a discriminative selection of treatment to meet the needs of each case. It was found that as many as 54 of the patients were dead. Among those who had undergone internal treatment, the proportion of the survivors fit for work was 55·5 per cent.; in this group the mortality of 24·7 per cent. was formidable. Yet Dr. Engel is of the opinion that internal treatment is definitely indicated in selected cases, particularly in those in which the patient is so young that neither thyroidectomy nor X ray treatment of the thyroid could be considered desirable. In this connexion table 15, which deals with 29 patients treated under the age of 26, is instructive. Among the 15 in this group who were given internal treatment only, there was only one death and two patients still unfit for work; the remaining 12 had regained working ability. The treatment given in these cases was varied; it included rest in bed, protection from psychic disturbances, sodium phosphate internally, various hydrotherapeutic remedies, and much else. The results of this polytherapy were worst in high-grade toxic cases and in secondary Graves's disease—i.e., cases in which thyrotoxic symptoms had appeared long after the development of a goitre. As for operative and X ray treatment, the mortality was lower and the proportion of patients achieving fitness for work was higher, although the material selected for one or other of these treatments was originally less satisfactory than that for which internal treatment was prescribed.

[1] Acta Medica Scandinavica, vol. lxxix., Fasc. I–II.

COLLECTED REPRINTS

COLLECTIONS of reprints for 1932 issued by two of our large teaching hospitals, the London [1] and the Middlesex [2] have reached us. Each of these collections reflects the character of the work pursued both in ward and laboratory. Thus at the London Hospital considerable attention is devoted to the filtrable viruses: contributions to our knowledge of this subject have been made by S. P. Bedson, J. O. W. Bland, and others. It may well be that the observation of a developmental cycle in the psittacosis virus marks the beginning of an important stage in our knowledge of these viruses. Among the clinical papers which form a considerable proportion of the total of 29 reprints, two are concerned with Bright's disease; there are also contributions discussing proteinuria in nephritis and the physiology of proteinuria. Other papers deal with the treatment of Addison's disease with cortical suprarenal extract and with different aspects of the anæmias. Neurological work is represented by a clinical study of pineal tumours and the histological investigation of other primary tumours within the central nervous system. Prof. H. M. Turnbull has published a paper on fœtal rickets; immunological studies are provided by T. Lumsden (tumour immunity) and from the chemical aspect by J. R. Marrack.

In the Middlesex collection the papers are divided into three groups: clinical (9), radiological (4), physiological and biochemical (15). The clinical papers deal principally with aspects of the cancer problem and with diseases of women. L. E. H. Whitby contributes a paper on the anæmias of pregnancy. An important and comprehensive article on idiopathic steatorrhœa by Izod Bennett, Donald Hunter, and Janet M. Vaughan is included here as well as in the London Hospital collection, since the authors include members of both hospitals. Amongst the physiological articles, those contributed by Prof. Samson Wright and his co-workers on the effects on blood pressure of section of the splanchnic nerves, and also the more general treatises on the part played by the sympathetic nervous system are valuable. Prof. E. C. Dodds and his co-workers have confirmed Lunde's claim that the alcohol-insoluble fraction of the blood iodine is increased in patients with toxic goitre, but do not find that this fraction is a measure of the toxic secretion of the thyroid gland. E. W. Riches and M. Kremer adduce clinical evidence in refutation of the claim made by W. Susman that the clinical course of malignant disease can be mitigated by the administration of pituitary extract.

ILLICIT TRAFFIC IN DANGEROUS DRUGS

T. W. Russell Pasha, the energetic director of the Central Narcotics Bureau of the Egyptian Government, to whose activities reference has already been made in our columns,[3] has just issued his annual report for the year 1932. Not only is the director able to claim a marked improvement in the restriction of narcotic abuse in Egypt, but he has coöperated in

[1] Researches published from the wards and laboratories of the London Hospital during 1932. London: H. K. Lewis and Co., Ltd. 7*s.* 6*d.* net.

[2] The Middlesex Hospital Medical School. Collected Papers. 1931–32.

[3] THE LANCET, 1931, i., 713.

tracking several international gangs of traffickers in dangerous drugs, and in exposing their lucrative and nefarious trade. He has thus set an example to some of those nations which have failed to give effect to their solemn obligations under the Hague and Geneva Opium Conventions. It appears that Turkey, which two years ago was making in the factories at Stamboul more than double the world's requirements of heroin, has discontinued the manufacture and is about to ratify these conventions and indeed to restrict the cultivation of the poppy to what is required for legitimate purposes. Unfortunately, as Russell Pasha tells us, "the European centre for the manufacture of heroin, destined entirely for the illicit trade, has now shifted from Istanboul to the capital of Bulgaria, Sofia." It is significant that Bulgaria, while a party to the Geneva Convention of 1925, has, it is understood, declined to accept the Limitation Convention of 1931.

By information gathered from Tientsin, Berlin, Hamburg, and Rotterdam, an organisation known as the Eliopoulos-Voyatzis-Del Gracio group of drug traffickers was unearthed, whose headquarters were in Paris until the French authorities in June, 1930, tightened their control of drug factories. During the first seven months of 1931 £240,000 had been transmitted to this Parisian group, from Tientsin by Jean Voyatzis. A search of the latter's heavy baggage at Port Said revealed, in his pocket book, a telegraphic code, with its key, by means of which this huge international contraband traffic in narcotic drugs was being systematically carried on. This discovery led to the break-up of the Paris combine and Elie Eliopoulos, the chief of the gang in September, 1932, at Athens volunteered to Russell Pasha a full account of his "illicit dope trade" for the past five years.

Details are given in the report of many other exposures of contraband traffic and of seizures of large quantities of opium, heroin, and hashish. The last named appears to be the narcotic at present most in favour among the addicts of Egypt. Russell Pasha justly puts the question—"Are civilised countries agreed or are they not that narcotic traffic is a world menace? Ask them individually and they can only answer yes. Why then will they not combine and classify narcotic trafficking as an international crime?" It is good to learn that the British Government have just ratified the Limitation Convention of 1931. It appears doubtful however whether the requisite number of 26 countries will have ratified by April 13th, in time for their convention to come into force by July 13th next.

METHYL-ACETYL-CHOLINE

THE depressor effect of choline was known long before R. Hunt and Taveau discovered the intense action of its ethyl ester and M. Villaret applied it to clinical practice. Villaret and his colleagues have never ceased to examine further the action of these choline esters on blood pressure in man. A peculiar feature in the effect of acetyl-choline was found to be the dissociation of its action as a vasodilator from that of lowering the arterial tension. This fact prompted the authors to investigate other esters of choline for a product of greater value in the treatment of hypertension. Their research[1] so far has pointed to α-methylacetylcholine as the drug which best fulfils their requirements. It is stated that G. A. Menge was the first to make the chloride of this compound and R. Hunt gave an account of its remarkable potency in reducing the blood pressure when given by mouth. Karrer's preparation of α-methylacetylcholine proved however to be quite unlike that of Menge and of Hunt. In the investigations of Villaret and his collaborators the bromide of α-methylacetylcholine was used as first prepared by M. Ernest Kahane. The inactivity of Karrer's preparation, it is suggested, may be due to its being an isomeric form, or alternatively it may actually be α-methylacetylcholine, whereas that synthesised by Menge is β-methylacetylcholine. Until this controversial point is decided the preparation will be described as methylacetylcholine though it may turn out to be a mixture of α and β forms. Its physiological properties have now been closely studied. Methylacetylcholine as well as its bromide reduce the blood pressure in animals when introduced directly into the jejunum. The substance may therefore be effective when given by the mouth. Methylacetylcholine instilled into the conjunctival sac causes an extreme degree of myosis, and is unique among known myotics in its ability readily to counteract the dilatation due to ephedrine. When administered subcutaneously to dogs, fall in blood pressure results from doses much smaller than those necessary when acetylcholine is used. The effect upon the blood pressure is moreover prolonged, lasting an hour or more, and during this time no effect is observable upon the heart, at least with injections of 1 to 4 mg. per kilo of body-weight. Given subcutaneously to a normal man 0·025 g. of freshly prepared methylacetylcholine is as effective as 0·2–0·4 g. (the usual dose) of acetylcholine. The individual who had this dose became red in the face, but the headache and unpleasant effects of histamine were absent; even with this dose there was evidence of arterial dilatation. The result of subcutaneous injection of methylacetylcholine in 12 cases is given in tabular form. The age of the subjects varied from 23 to 70 years, and the dose ranged from 0·01 to 0·03 g. The arterial tension was noted before the injection, 10 or 15 minutes, 1 hour, 2 hours, and sometimes 3 hours after the injection. In most cases a considerable fall in blood pressure was registered and was sustained for at least one hour: an exception was in a woman of 70. The authors make little comment on these interesting results and imply that they are awaiting the accumulation of further data.

[1] Villaret, M., Justin-Besançon, L., Cachera, René, and Said: Ann. de Méd., 1932, xxxii., 385.

SIBBALD'S MEMOIRS

Sir Robert Sibbald of Kipps was geographer and physician in Scotland to Charles II. and later physician to James II. He was the first professor of physick in the University of Edinburgh and founded there the Royal College of Physicians, becoming in succession its secretary, councillor, censor, and president. He died in 1722 leaving in manuscript reminiscences of his life up to 1692. Mr. Francis P. Hett explains at the outset that it had been his original intention to publish[1] merely this autobiography, with any introduction or notes that might be necessary, but the appearance of a book suggesting that Drummond's "Conversations," the source of much of our information about Ben Jonson, were not written by the Scottish poet William Drummond, of Hawthornden, but were concocted by Sibbald, led to an expansion of the work to include a refutation of the charge. The author acknowledges that such a refutation had already been published, but in a place where, in his opinion, it was little likely to be generally read. Sibbald's "Memoirs of My Life," were not intended for publication, and were probably written to excuse a

[1] The Memoirs of Sir Robert Sibbald. Edited by Francis Paget Hett. London: Humphrey Milford, Oxford University Press. 1932. Pp. 105. 10s. 6d.

temporary conversion, late in life, to the Roman Catholic faith, which was undoubtedly regarded as a triumph to the Jacobite cause, and a discreditable defection by the other side. The Memoirs were highly commended by Samuel Johnson as an honest picture of human nature, that large-minded scholar finding that if the convert's rapid reconversion to the Protestant church was due (as it would appear to have been from his own words) to inability to undergo the rigours of fasting, we had "another example of how small may be the primary motives of a man's greatest actions." The Memoir which has been transcribed from a certified copy in the National Library of Scotland of an original manuscript which formerly belonged to Boswell, gives a graphic picture of life in Scotland at the end of the seventeenth century as experienced by a scholar, a professional leader, and one who was in close touch with high Scottish society, and all who study medical history will find in it many interesting passages. The clearing of Sibbald from the charges of forgery is done with great vigour. The "Conversations" existed for a long time in MS., and form an account of the intercourse between Ben Jonson and Drummond, and their authenticity was not challenged until 1925, by Mr. C. L. Stainer, who gave reasons for believing that they were not written by Drummond at all, but were concocted by Sir Robert Sibbald about 1710, that is to say, nearly a hundred years after the usually accepted date of their writing. Mr. Hett's refutation of the accusation is conducted with great care, and he believes that he has removed an aspersion, which he considers ridiculous and revolting, from the name of a distinguished doctor.

HARRISON MARTINDALE

Mr. W. Harrison Martindale died on April 8th, in his 59th year, after a short illness: his name must be familiar to most of our readers, while he did work of an abiding value for which the whole medical profession is indebted. He was the son of Mr. William Martindale, who founded a pharmaceutical business at No. 10, New Cavendish-street, London, in 1873, and the son was born over the shop the year after the business was founded. He was educated at University College, London, and Marburg University, and, on following his father's profession as a pharmaceutical chemist, was apprenticed to Messrs. Wright, Layman and Umney. He obtained the Ph.D. degree at Marburg in 1898, and on the death of his father in 1902 took over the New Cavendish-street business. He showed immediately his capacity and aspirations. He turned the establishment into a compact whole by using the large premises at the rear for wholesale and manufacturing departments. From his laboratory there issued for many years a constant stream of new chemical and pharmaceutical preparations, and a glass-blowing department was installed to deal with the growing demand for sealed ampoules to be used in the administration of remedies of all kinds. Though Harrison Martindale was known personally to comparatively few of the medical profession his name had become something of a legend when he succeeded his father. The Extra Pharmacopœia of Martindale and Westcott was first issued jointly by Dr. Wynn Westcott and Mr. William Martindale in 1883; the issue was sold out within a fortnight, and ten editions had already appeared before Harrison Martindale took over the work on his father's death in 1902. Since Dr. Westcott's death in 1925 Dr. Martindale had been solely responsible for the work, and the preparation of the 20th edition, which appeared in Sept., 1932, was done at high pressure. In the preface to this edition he expressed the hope that some of the information embodied in it might prove helpful to suffering humanity. The hope had long been fulfilled—witness the concluding sentence of a review in our own columns 15 years ago—"The Extra Pharmacopœia is one of the few books which medical practitioner, analyst, and pharmacist cannot afford to be without." The erudition, the pertinent scientific and commercial information, and the abundance of accurate references contained in these volumes never fail to strike their many readers.

DR. MARTINDALE

Although the work entailed by his literary and business activities was incessant, Dr. Martindale found time to be a Baron of the Cinque Ports and one year mayor of Winchelsea. His last illness was short and severe, but he had undoubtedly compiled the last edition of the Extra Pharmacopœia under conditions of particular strain. He leaves a widow and one son, Mr. W. H. M. Martindale.

THE HYGIENE OF FOOD

FROM the recent report of the Department of Scientific and Industrial Research, it may be seen that the National Physical Laboratory studies many matters of public health and domestic interest, such as the best material for wrapping meat, the effect of temperature on the ease with which butter can be spread, the thermal properties of refrigerants, and the heat transfer between metal pipes and a stream of air. The work of the Fuel Research Board has important bearings on atmospheric pollution. The committee examining this latter question reports that a number of local authorities are now using the routine method recommended by them for the determination of sulphur gases in air and the question of pollution of street air by carbon monoxide from motor exhausts has been considered. It appears at present to be negligible. The work of the Food Investigation Board has many contacts with home life. Acetaldehyde given off by apples during storage helps to preserve the fruit from fungal attack, as also does ammonia which can be supplied conveniently by dissociating ammonium salts. Carbon dioxide has an inhibiting effect on the growth of bacteria and moulds on meat, even in as low a concentration as 4 per cent. In an atmosphere containing 20 per cent. of CO_2 the life of chilled meat appears to be doubled. Spoilage of meat in butchers' refrigerators is sometimes due to heavy infection of the premises with moulds, at others the design of the store and the temperature are unsuitable. Freezing or cold storage at very low temperatures will reduce the vitamin-C content of sheep's liver. Whilst pork keeps well in carbon dioxide but not in nitrogen, both lean and fat of bacon exhibit the reverse behaviour. The Torry laboratory has investigated the bacteriology, the oils and fats of fish and the smoke-curing of finnan haddocks and such fish, as well as the use of fish liver in the treatment of pernicious anæmia. The department also assists research associations connected with various industries. The Flour Millers

Association has investigated the causes of the difference of grades in flours milled from the same wheat; contrary to the general impression the low grades do not owe their inferiority to the presence in greater amounts of oils and lipins, lipoids or phosphatoids (as they are variously called), since these and especially oils definitely improve bread. Flour oil, indeed, is one of the best bread improvers. The common impression that the presence of germ is deleterious to baking quality is not well founded. The so-called solubility of cocoa, that is, the relative permanence of the emulsion formed when it is prepared as a beverage, has attracted the attention of the appropriated trade association; clumping can apparently be avoided by mixing the powder first with a little water or milk and stirring thoroughly before adding the remainder of the liquid. The canning of kidneys and livers, for which supply and demand vary seasonally, has been studied to enable these products to be stored without deterioration until their season is at its height.

SLUM CLEARANCE

PROGRESS in slum clearance has been extremely unequal. In some areas great things have been done; shored-up hovels and filthy tenements have been destroyed and blocks of modern dwellings have risen in their place. In other areas, however, almost no progress has been made and undoubtedly in some places an attempt to work out the plans of the Ministry has had the unfortunate result of forcing people to leave insanitary dwellings which they occupied at a low rental and offering them in exchange only very superior dwellings at a rental so increased as materially to affect the family budget. The Minister has now issued a call for general speeding up all round and a complete solution of the slum problem within five years.[1] The circular maintains that indirect influence cannot be relied on to solve the difficulty and that the problem for housing authorities is one which is strictly limited both as to cost and as to time. Sir Hilton Young calls now for programmes from every local authority, giving lists of the areas in which clearance or improvement is necessary with information as to the number of houses to be demolished or reconditioned and of the inhabitants concerned, together with a time-table for the negotiation, progress, and completion of the necessary action. He hopes to receive these programmes within the next few months and in any event not later than Sept. 30th, and points out that all the material should be readily available in the records now kept by local authorities for over twenty years under the Housing Consolidation Regulations. London, he admits, is a problem by itself, and more time will be required to deal with it, but he hopes that metropolitan borough councils will confer with the London County Council and transmit a general programme for the whole county. He points out that there is no time like the present for work of this nature. Building costs are low and money is cheap, and it should be well within the capacity of every local authority, with the aid of the subsidy available, to build suitable accommodation at rents which compare very favourably with the average rent paid by tenants of slum houses. The problem is not only one of cities; as the circular points out, there can be few, if any, small towns or even villages in which there is not urgent need for some kind of action under the Act of 1930.

All medical men will congratulate the Minister on his vigorous action and will hope that he may receive the support he deserves from the local authorities. Many medical officers of health are tired of condemning houses only to find that they remain occupied year after year. The task of rebuilding the slums is by no means an easy one, since both owners and tenants have to be placated, but the experience of those who have tried and succeeded shows clearly that the work can be made an economic proposition and that the best method of overcoming objections of tenants to be removed is to clear the area and rebuild on the same site. This is usually essential in large cities, but in places where land is available there is a tendency to build the new accommodation at some distance from the old and, not unreasonably, the unfortunate tenants have disliked being uprooted from among their friends. Members of the local authority should visit the slums and see the conditions. There is little doubt that personal inspection of this kind would go a long way towards producing that eager enthusiasm which is an essential if the work is to be done quickly and to be done well. Those who have not seen can hardly believe, however eloquently it is told them, the conditions in which many of their fellow-creatures are living to-day.

[1] Circular 1331. Ministry of Health. April 6th, 1933. H.M. Stationery Office. Pp. 4. 1d.

TESTS FOR THERAPEUTIC AGENTS IN PERNICIOUS ANÆMIA

A RELIABLE laboratory test for the potency of substances effective in pernicious anæmia is not at present available. The only sure proof of potency is that given by a reticulocyte response and clinical improvement in a patient. It is becoming increasingly difficult to find untreated cases of pernicious anæmia which can be used for such clinical testing of material of unknown potency, and some method of laboratory assay would be of great value. Experimental results obtained by Vaughan, Muller, and Zetzel in 1930 [1] suggested that the response of the reticulocytes in grain-fed pigeons might prove a satisfactory index of potency. They found a definite rise in the reticulocyte count after the administration of materials effective in pernicious anæmia. Inactive substances were without influence upon the blood picture. Other workers have hitherto failed to confirm their results. L. Wills [2] found spontaneous fluctuations in the reticulocyte level too great to allow a definite interpretation of experimental results to be made. Edmunds, Brueckner, and Fritzell [3] have, however, recently published observations which confirm the main findings of Vaughan and her co-workers, though with certain qualifications. They found a reticulocyte count of 20 per cent. as an average in untreated birds. It might sometimes be as high as 40 per cent., but even in such birds known potent material caused an appreciable rise. The maximum response occurred after the eighth or tenth day. This is later than in Vaughan's series, but is possibly due to the fact that she used relatively pure extracts administered intravenously. Occasional pigeons fail to react or give a delayed response for reasons which are not at present clear. Edmunds suggests that such a difficulty can be overcome by using a group of birds for a test.

Sir Thomas Lewis has been appointed a member of the Medical Research Council in succession to Prof. J. J. R. Macleod.

AT a meeting of the Royal College of Physicians of London last Monday, Lord Dawson was re-elected president.

[1] Brit. Jour. Exp. Path., 1930, xi., 456.
[2] Ibid., 1932, xiii., 172.
[3] Jour. Amer. Pharm. Assoc., 1933, xxii., 91.

SPECIAL ARTICLES

THE CONSULTANT SERVICE OF THE L.C.C.

A FURTHER MEETING OF LONDON CONSULTANTS

AT a general meeting of consultants and specialists called at B.M.A. House on March 28th by a Consultants' Committee consisting of Dr. J. P. Martin, Dr. W. J. O'Donovan, Dr. Percy Spurgin, Mr. R. Davies-Colley, Mr. J. D. M. Cadell, Mr. F. Courtenay Mason, Dr. W. Howard Jones, Dr. M. Donaldson, Dr. J. W. McNee, Mr. Aleck Bourne, Mr. P. H. Mitchiner, and Dr. A. A. Moncrieff, the action of the London County Council in formulating a scheme of consultant service, without affording the consultants an opportunity of discussing the proposals before adoption, was deplored, and the consultants and specialists of London were advised not to make application for posts in this service or, if application had been made or was contemplated, to place notices of withdrawal in the hands of the Medical Secretary of the British Medical Association.

A further meeting was held on April 11th, when the chairman, Mr. H. S. Souttar, outlined the position reached and Dr. O'Donovan moved :

"That this general meeting of consultants, realising the far-reaching importance of the principle in dispute between the consultants and the London County Council, requests the Council of the British Medical Association to take action on behalf of the consultants, particularly in view of the offer of the Voluntary Hospitals Committee for London to act as mediator, and instructs the committee not to proceed at present with the plan of withdrawal."

This resolution was approved with only two dissentients, and Dr. C. O. Hawthorne then moved two other resolutions which were carried unanimously :

"That this meeting of medical and surgical consultants and specialists practising in London, having received the report of the committee relative to the medical services of the L.C.C., expresses its appreciation of the activities of the committee recorded therein, and thanks in particular the chairman (Dr. O'Donovan) and the medical secretary (Dr. C. G. Anderson)."

"That the meeting, in reappointing the committee, repeats its regret that representatives of the consultants and specialists were not afforded an opportunity, prior to its adoption, of considering the scheme recently approved by the L.C.C. ; for, had this course been followed, the meeting is convinced that in several respects modifications advisable in the public interest and necessary to engage the goodwill of the medical profession could have been secured."

The matter now comes before the meeting of the B.M.A. Council on April 12th.

LISTER AND HIS TIME*

BY SIR CHARLES BALLANCE, F.R.C.S., K.C.M.G.
CONSULTING SURGEON, ST. THOMAS'S HOSPITAL

Sir Charles Ballance began by quoting the lines :

"To those who knew thee not, no words can paint ;
And those who knew thee know all words are faint."

The whole life of Joseph Lister, he said, all his physical strength, all the high attainments of his mind, had been consecrated to winning control over the septic diseases which are so fatal to the life of man. Lister had had no other ambition but to serve, and this continuing devotion to a noble purpose had proved in him the source of an ever-widening river of happiness. "The strongest personalities are the outcome, not so much of striving for personal honour and fame, as of never-ceasing unobtrusive and faithful endeavour in the path of daily duty and of faith in an ideal" : these words exactly expressed the reason for the influence and attraction which the lives of Lister and Pasteur exerted on the mind of the average Englishman. The lecturer said that, whether he was visiting a surgical operating theatre in a lonely Pacific island or in some great city, he always sensed in it the living spirit of Lister, whose labours had ransomed countless numbers of our race from pain, from illness, and from death, and the lapse of time was powerless to dim their lustre. History had deliberately pronounced that amongst eminent men none had left a more stainless and none a more splendid name. The whole earth was the sepulchre of Lister.

The lecturer then sketched Lister's early professional life and the influence of Pasteur on it, and recalled his own personal contacts with him at King's College Hospital, including the meeting of the Medical Society of London in 1877, when Lister had described the first open operation for transverse fracture of the patella. He recalled that when he had visited Lister in Park-crescent after a period of study in Germany, the great master seemed to have been endeavouring to learn something from the struggling young surgeon—a great encouragement.

Sir Charles Ballance thought that Lister would have taken much interest in certain recent investigations, particularly the following :

1. The regressive changes in the cells of the facial area of the left Rolandic cortex following experimental interference with the right facial nerve.
2. The contractile tissue of the iris.
3. The culture of the cells of the embryo sciatic nerve (*a*) in the egg ; (*b*) in the subdural space ; (*c*) by the ordinary method of tissue culture.
4. The ligation of arteries and the intimate process of the absorption of ligatures.
5. Double lateral implantation of the ends of a damaged nerve into the side of an intact neighbouring nerve.
6. The histology of incubated carcinomatous and normal tissues.

SOME NEUROLOGICAL INVESTIGATIONS

Recent work had shown that there was a much more rapid return of function in the facial muscles when a cut facial nerve was substituted by a nerve-grafting operation in the aqueduct of Fallopius than when it was anastomosed to another nerve. After section of this nerve the large pyramid cells had shown disappearance of the Nissl granules, except at the base of the axon ; diminution and alteration of the shape of the body of the cell ; loss of the cell processes ; and an eccentric position of the nucleus.

Lister's first contribution to the literature of science, in 1853, had been entitled "Observations on the Contractile Tissue of the Iris." The lecturer showed slides illustrating his own confirmation of Lister's statement that the dilator fibres of the iris consist of many narrow bundles running inwards separately between the vessels and being inserted into the border of the sphincter.

Attempts to cultivate the cells of the embryo sciatic nerves in the egg had failed, but transplants into brain tissue had been more successful. There was no evidence that the brain tissue itself acted otherwise than as a culture medium. Kanji Arai had found that axis cylinders persisted for two or three

* Abstract of the Lister Memorial Lecture delivered at the Royal College of Surgeons of England, on April 5th, 1933.

months in a nerve embedded in brain tissue, but the lecturer had found that they broke up at once in the subdural space. The whole subject required further investigation. He described tissue culture experiments with the sciatic nerve of the 15- to 18-day-old embryo chick. During the late war, he said, he had seen many instances of end-to-side anastomoses between a damaged and an intact nerve. The operations had been successful if intelligent after-treatment had been pursued for a long period. He thought that this operation would become of much importance in the nerve surgery of the future. It was clearly better to employ a living nerve as a graft than to transfer a portion of nerve from some other region of the body and to inveigle it into position between the two ends of a divided nerve.

ABSORPTION OF LIGATURES BY LIVING TISSUES

In 1868 Lister had tied the common carotid artery of a calf with peritoneal ligature. Thirty days later this ligature had appeared to be still in place, but in fact it had been transformed into a band of living tissue, continuous in structure with the arterial wall. As Lister had explained, "the new tissue takes as a model the old, and forms at its expense, the old tissue is absorbed by the new, and as the old is absorbed, the new is put down in its place." The ox-peritoneum ligature had appealed to Lister, as it was a tissue corresponding in nature to that of the outer coat of an artery. Gold-beater's skin was made from ox-peritoneum. Secondary hæmorrhage had been rife in the wards of St. Thomas's Hospital when Sir Charles Ballance had been a house surgeon in 1880, and he had determined to tackle the problem of ligature as soon as possible. Lister had declared himself ready to undertake the ligation of the innominate artery. The results of ligature up to that time had been appalling, but after Lister had pointed the way to success many surgeons had proved the truth of his statement by their successful ligation operations. Since Lister's death Prof. Perthes, of Tübingen, had shown how great arteries could be obstructed, without injury to the intima, by using a broad piece of fascia as a ligature and folding a piece of the same tissue under the knot. This seemed like a return to the early practice of great surgeons, such as Paré, Munro, and John Hunter; surgery appeared to move in circles, but in fact it moved in spirals. The lecturer and Walter Edmunds had devised a knot for tying the great arteries in continuity, and this knot had never failed him. They had also experimented on intestinal and gastro-intestinal anastomosis. At that time plates, buttons, bobbins, and rubber air bags had been fashionable, but they had come to the conclusion that suturing of the intestine required nothing but a needle and thread. Two or three years later von Mikulicz, of Breslau, had told him that any surgeon who wanted anything more than a needle and thread should not be allowed to suture the intestine.

The process of absorption of the ligature had been studied indirectly by Sherrington and himself in 1887, when they had observed the digestion of leucocytes and red corpuscles in the food vacuoles of the wandering connective tissue cells. Unshielded, uncoagulated proteid matter was the food of perfection for the connective tissue cell as for the amœba; the wandering cell of the body might be looked upon as a hot-house variety of amœba. Monads that came to rest against the protoplasm of amœbæ became inert and dead and were apparently acted on by the same agent as that present in the food vacuole. Not all parts of the foreign body were taken into the food vacuoles of the invading cells; some were disintegrated by the proteolytic ferment secreted from their surface.

HISTOLOGY OF INCUBATED TISSUE

Sir Charles Ballance then turned to a description of his work with Prof. Shattock on the appearances of incubated carcinomatous cells. His own family had been decimated by malignant disease, and as a student he had vowed himself to this investigation. He and Shattock had met three times a week from 7 until 11 in the evening in Shattock's room at St. Thomas's Hospital medical school. They had enjoyed the interest and support of Paget, and Michael Foster had spent one long evening with them. They had worked together on carcinomatous cells which had been incubating for from 7 to 33 days. They had found that the outline of the cell protoplasm was invisible. The nuclei were granular, the nuclear matrix between the granules being slightly stained or colourless. Many nuclei had a spinous border due to the projection of granules, the limit of the nucleus being clearly defined; in other instances the granules had passed beyond the margin of the nuclei, being connected to them by an extremely delicate thread-like stalk. They might be spheroidal, oval, or comma-shaped.

He suggested that the extruded particles might be regarded as cancer-sperm, their extrusion having prepared the nucleus and cell for subdivision, while they themselves represented the male elements and incited division in others, after the manner of a spermatozoon. The cells of normal tissues when incubated showed no sign of these granules, and their real meaning was still unknown. Pieces of incubated cancer, when implanted in the tissues of a living animal, did not infect it with the disease, but this negative result did not disprove the presence of an infective agent. It was in some ways comparable with the failure to transmit malaria to a healthy bird by the injection of blood containing the hæmatozoon from a malarious bird.

PERSONAL REMINISCENCES

Sir Charles Ballance concluded with a vivid description of pre-Listerian surgery as he had seen it at St. Thomas's Hospital in 1875, and said that the pageant of surgery through which he had lived had been the most glorious of all time. He quoted the statement of Le Dentu that "no young man could know the impressions produced on the mind of a surgeon who had started his career at the epoch of limited surgery and had marched on to the conquest of the immense progress promised by the gifted initiators of the new method." To illustrate how recent was our knowledge of bacteriology he mentioned a lecture he had attended in 1880 on the subject of scrofula. The lecturer had said that he had gathered dust from St. Paul's, from Westminster Abbey, and from his own drawing-room, and had placed it under the skin of a series of guinea-pigs, all of which had become infected with scrofula. He was therefore satisfied that the disease could not be a specific one, as the specific agent could not be in all these three places! This was just a year before Koch had demonstrated the tubercle bacillus. Sir Charles Ballance had attended the first class in bacteriology ever formed in the University of Leipzig. Each member of the class had to prove the specificity of each known pathological organism, by himself carrying out, to the satisfaction of the teacher, Koch's four postulates. When he had returned to England he had suggested to the Pathological Society that bacteriology would soon have to be added to the curriculum of medical students; his proposal had been received with great hilarity.

AN OUTBREAK OF ACUTE ANTERIOR POLIOMYELITIS

BY C. FRASER BROCKINGTON, M.D. CAMB., D.P.H.
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BETWEEN Sept. 4th and Oct. 31st, 1932, the urban district of Redditch (population about 20,000), a township with seven schools and a child population of 2205, suffered a limited outbreak of acute anterior poliomyelitis. There were eight cases, with a ninth case in a neighbouring township which seemed to be connected. The ages of those affected were: 24, 13, 8, 6, 5, 5, 3, and 2.

The cases occurred in the following order:—

CASE 1.—On Sept. 4th a male, aged 24 years, entered his doctor's surgery with a sore-throat and a temperature of 103° F. He went to bed at once, 12 noon, and when visited in the evening was vomiting and complaining of pains in the stomach. The following day, after a restless night, he continued to vomit, had pains all over, and complained of difficulty in passing his water, and a feeling of suffocation. The following day he developed a flaccid palsy of both limbs, and later of one arm. His difficulty in breathing became worse, and the diaphragm was found to be functioning poorly. There was marked stiffness of the neck. On the 7th he died, quite conscious until the last, and much distressed from inability to breathe.

The diagnosis of poliomyelitis was not at the time considered; the course of the illness was rapid, and no special investigation could be made. In the absence of such special investigation, the diagnosis cannot be made with any certainty. The differential diagnosis is, however, limited to (1) the rare form of ascending poliomyelitis; (2) polyneuritis (in which Landry's ascending paralysis is included); (3) some form of spreading myelitis—e.g., transverse myelitis, and (4) hæmatomyelia.

The loss of sphincter control, the sudden onset of fever, and the excessive vomiting are sufficient to exclude Landry's paralysis; the absence of sensory loss excludes a spreading myelitis, and the high fever, vomiting, and absence of sensory loss exclude hæmatomyelia. The sudden onset of high temperature, the incessant vomiting, the rigidity of the neck, and the sphincter loss are greatly in favour of poliomyelitis. The probable pathology was infection with the virus of poliomyelitis manifesting itself in the rare, ascending form, and resulting in death from bulbar palsy, and for the purposes of analysis this diagnosis will be assumed.

The man was of fine physique and athletic. Among his many activities was included the coaching of a junior cricket team composed chiefly of boys from School A. with two from School B.; these he coached on Saturday afternoon, the day before his illness. One of his greatest friends, with whom he spent every evening of the week before his illness, which began on a Sunday, is a master at School B. (boys). As far as could be ascertained, he did not come into contact with any smaller children, or children from other schools, and he lived alone with his father and mother, working as clerk in a local factory.

CASE 2.—On Sept. 11th a girl, aged 13 years (School B. (girls)), complained of pain in her head and eyes, and had a high temperature. She felt sick but did not vomit. She had no other pains until four days later, when she complained of pain in the back and pains in both her legs. She was later found to have a dropped right foot.

CASES 3 and 4.—On Sept. 17th an infant, aged 5 years, at School B. said he felt poorly and had a cold. He was taken on the same day by his parents to the south coast, Plymouth. He had no sickness or pains, but developed weakness of the right arm on Sept. 19th. On the same day another infant, aged 5, in School A. fell ill with vomiting and headache. Eight days after this he complained of pains in the legs and stiffness and was found to be palsied in the right leg.

CASES 5 and 6.—On Sept. 25th a baby, aged 2, cried whenever her arms or legs were moved and, on reaching the Birmingham Children's Hospital, was found to be palsied. This infant was seen by the doctor at the local infant welfare centre, where a large attendance of babies and preschool-children takes place weekly. On the same day a second infant at School A., aged 6 years, seemed poorly at school and complained of headache. He had no sickness. On the following day his legs were painful, on the fifth day both legs were found to be palsied.

CASE 7.—On Sept. 26th a second infant in School B., aged 5 years, complained of pain in the lower back and headache, and was sick. On the following two days he screamed with pain in the arms and legs, which were found to be weak.

CASE 8.—On Oct. 9th an infant, aged 3 years, who had visited Redditch ten and two days previously, to the house of a relative, was poorly, without appetite, and constipated; he vomited. Three days later he was found to be weak in the arms, and he died on Oct. 21st. His contact in Redditch appeared to be at one house, and here there was one child only; this boy attended School A.

CASE 9.—On Oct. 31st a girl, aged 8 years, who for the past two months had been in bed with a rheumatic heart, was taken suddenly ill with intense headache, pains in the back, and vomiting. On the following day she had a stiff neck and very high fever. The following day there was a palsy of the right leg, and then of the right arm. She died on Nov. 3rd. This child, though bedridden, was wheeled about occasionally in an armchair and was frequently visited by friends from her own school in the Redditch suburb of X. No other case occurred in the school. A party was held at her bedside the day before her illness. After death she was visited by school friends to view her remains. None of these contacts became ill in any way except one girl at the party (vide infra).

It will be seen that three of the nine cases ended fatally—the first in the adult, the eighth in a baby of 3 years, and the last in a child of 8 already suffering from rheumatic carditis. The other baby completely recovered. One girl has a residual dropped foot, one boy has a residual palsy of the left leg, one of the right arm, and the remaining two boys have residual palsies of both legs.

EVIDENCE OF ABORTIVE ATTACKS

In no instance did inquiry reveal any evidence of symptoms which could have been considered evidence of an abortive attack in any other member of the family. The child of 8 at X, who died, had a birthday party on the day before she fell ill at which one child aged 5 was suddenly sick and went to bed; she lived next door. This child did not, however, complain of headache, pains, or stiff neck such as would suggest an abortive poliomyelitis, and she has been well since. This child attended the infants' department at X and did not come into contact with children from Schools A or B.

A study of the school registers of the affected schools showed that there were eight absentees with colds during the three weeks before the disease appeared. Careful inquiry from the mothers did not in any instance suggest that the illness was other than a simple cold; there was no sickness, headache, pains, or stiff neck. One of these children was a dancing partner of Case 6, and her cold occurred on the day following his illness; she is a delicate child and frequently absent.

FEATURES OF THE OUTBREAK

Here, then, we have a small township, busy with factory life, which quite suddenly during the months of September and October is subjected to an outbreak of poliomyelitis. Three days after the children had returned to school at the end of the summer vacation, a strong, athletic man of 24 years is suddenly stricken and dies within three days. He has a great friend, with whom he spends his evenings, a master at one of the schools. A week after the onset of his illness a girl at this school develops poliomyelitis, and this is

followed a week later by another case in the infants' department of the same school, and on the same day by another in the infants' department of another school attended by the boys of the cricket team which the first patient coached the day before he fell ill; these are followed in another week by a further case in each infant department (but in separate classes) and by a case in a baby in a far distant point in the town. The outbreak is now apparently finished. In the early part of October, a baby in a neighbouring township (Y) who has recently visited Redditch falls ill and dies. Lastly, towards the end of October, a girl of eight in the adjoining suburb of X, with no ascertainable contact, falls ill and dies.

Investigation brings out the following points.

(1) The cases were widely separated with no special grouping. Inquiry did not in any case reveal any house-to-house contact; the families were unknown to each other; none of the affected children was friendly with any other. The first case in the adult occurred in a new council house in an outlying part of the town; no further case occurred near this. One of the infants lived in an isolated cottage on the outskirts, having home contact only with a sister. Three of the other boys were "only" children. In most cases the mothers complained that their children did not mix with others at home.

(2) The housing varied from the best new council houses to a poor dwelling in an overcrowded slum row.

(3) The milk-supplies were varied, including Grade A, pasteurised, and ordinary loose milk. They came from different sources and through different distributors.

(4) The local infant welfare centre was attended by one of the two babies, but the remaining cases were in no way connected, directly or indirectly, with the centre.

(5) The infection seemed in some way to be associated with school attendance. The evidence of this we have is (*a*) that contact, other than that at school, could in no instance be established; (*b*) that two cases occurred in each of two infant departments; and (*c*) that all the cases except one were connected directly or indirectly with the same schools—the Redditch baby with two girls aged 12 and 13, and the baby at Y with a boy cousin from the same school. Only the bedridden child at X remains unconnected with either of those two schools.

(6) Lastly, it is evident that direct contact was of no great significance, since direct contact between cases could have occurred only in the case of the four infants, two each at two schools; these infants were in different classes. Further, in no instance did the immediate contact who would be directly exposed to a high dosage of virus—i.e., those seated next to a case in class or those of the same family—succumb.

THE SPREAD OF POLIOMYELITIS

There has always been difficulty in tracing direct contact between cases of poliomyelitis. Since the first epidemic recorded by Medin [1] at Stockholm in 1887, numerous epidemics have been carefully investigated in Europe, America, and Australia.[2-5] On every hand the lack of connexion between cases is emphasised, a point which is well illustrated by the report of a government inquiry in Norway at the beginning of this century. At the time Gersvold [6] said "that he felt convinced that the disease *was* contagious but that in Christiania a painstaking investigation had failed to demonstrate any connection between the cases"; such was the uncertainty which prevailed after 20 years of careful investigation in three continents. It was not until 1912 that Kling, Pettersson, and Wernstedt,[7] working with monkeys, brought forward their evidence for transmission by human carrier. The following year, in 1913, Flexner and Noguchi [8] isolated a virus, filtrable by Berkefeld V and N from the nasal mucous membranes of those with acute attacks, and later [9] in 1915 successfully cultivated the virus to visible globular bodies.

The same virus has been found in the nasal mucous membranes of persons with "abortive" attacks and in contacts, so that the theory of "carrier" spread may be said to have been established on firm ground. Yet certain features of poliomyelitis outbreaks are very unlike those found in other known carrier diseases—e.g., cerebro-spinal fever and diphtheria—and it is noteworthy that Flexner himself [10] believed the existence of healthy carriers to be exceptional. In particular there is no tendency to spread in institutions, so that many hospitals have for years nursed cases of poliomyelitis in their general wards without experiencing a single secondary infection; contrast with this the readiness with which diphtheria spreads in institutions and the increasing frequency with which cerebro-spinal fever occurs in proportion as the distance diminishes between the beds in soldiers' camps.

The absence of secondary infections in children's hospitals has been attributed to the fact that such children do not enter the hospital until the paralytic stage, when the risk of infection may be passed. This is in agreement with Flexner's failure to find the virus, except in rare instances,[11] in the nose of patients after the tenth day from infection, but it is equally certain that there are many instances, such as the cases quoted by Osgood,[12] in which the virus has been found long after recovery, even up to two years. If indeed poliomyelitis is, like cerebro-spinal fever, an instance of a carrier disease in which cases begin to appear when the carrier rate exceeds a certain concentration in the population, there must be some additional factor which makes the epidemic selection so much more erratic.

This same factor will account for the rarity with which children of the same age infect one another, despite very close contact. It is, for instance, uncommon for more than one child in a family to be attacked; indeed, many writers [13-16] have taken the trouble to make special mention of multiple cases in a family. In the present epidemic infants of the same age sitting at close contact with acute cases in double desks escaped infection, and no second case occurred among the preschool-children who thronged the infant welfare centre on the day that Case 5 attended in the acute stage. It is not clear what this unknown factor causing the erratic selection of cases may be. It has been suggested [17] that it depends upon a very high proportion of immune persons, so that, while diphtheria works among a child population only 60 per cent. immune, poliomyelitis works among a child population 90 to 95 per cent. immune. The suggestion is here made that variations of the nasal mucous membranes may exist, due to some local condition, possibly a variation in the bacterial flora, and that this alters their suitability as a "soil." There remains to be mentioned that Aycock [18] and Dingman [19] have brought forward evidence to show that milk has caused a spread of the disease. While it is possible that milk may cause epidemics in certain circumstances, there is no likelihood that it is usually concerned. In the above epidemic the milk-supply was varied and had no connexion with the cases.

AN INTERPRETATION OF THE EVENTS

In conclusion the suggestion is hesitantly made that in the present epidemic the following sequence of

events may have taken place. A small township in which no obvious case of poliomyelitis has occurred since 1928 reaches the late summer of 1932 with the usual susceptible population of infants of 1 to 6 or 7 years of age. An adult returns from a summer holiday introducing a fresh organism, or he may have increased the virulence of the existing organism during his own fatal illness in early September—just after the schools reopened. His friend carries the fresh or revitalised organism to School B. where he is master, and the boys of a cricket coaching class carry it to School A. The organism runs rapidly through these two schools; at the end of a week a case occurs in the girls' department of one school, and still later, as the organism reaches the infant classes certain susceptible infants succumb. A boy and girl from School A. respectively carry the infection to two babies in Y and in Redditch. An isolated girl, aged 8 years, in the adjoining suburb of X, bedridden with rheumatic carditis, is infected from her visiting girl friends, but in this case the contact with either School A. or School B. cannot be made.

If the above sequence of events can be considered probable, the outbreak is an example of an epidemic of a virus infection at work among a population of relatively few susceptibles in which there is a wide incidence of carriers and a few scattered and unconnected clinical cases. It seems probable that the appearance of a clinical case requires the presence of special factors such as (1) a high carrier population giving the chance of heavy infection, (2) heightened virulence of the organism by human incubation, and (3) possibly some peculiarity of the nasal mucous membranes increasing their suitability as a soil. The need for this last factor, a suitable soil in which the virus can grow, may afford an explanation of the erratic and unconnected case-incidence, which is such a striking feature of epidemics and which for a period of twenty years, until the discovery of the virus, prevented any absolute proof of the infective nature of the malady.

REFERENCES

1. Medin, O.: Hygeia, Stockholm, 1890, lii., 657; Verhandlungen des X Int. Med. Cong., Berlin, 1890, ii., 37.
2. Caverley, S. S.: Yale Med. Jour., 1894, i., 1; Jour. Amer. Med. Assoc., 1896, xxvi., 1.
3. Collins, J.: New York Med. Rec., 1907, xxxii., 725.
4. Litchfield, W. F.: Australas. Med. Gaz., 1904, xxiii., 346.
5. Burnett, Ham B.: Ibid., 1905, xxiv., 193.
6. Harbitz, F., and Scheel, O.: Jour. Amer. Med. Assoc., 1907, xlix., 1421.
7. Kling, C., Pettersson, A., and Wernstedt, W.: Communication de l'Inst. Méd. de l'Etat à Stockholm, 1912, ii., 61.
8. Flexner, S., and Noguchi, H.: Jour. Amer. Med. Assoc., 1913, lx., 363.
9. Flexner, S.: Amer. Jour. Dis. Child., 1915, ix., 353.
10. Flexner, S.: Contributions to Med. and Biolog. Rev., 1919, ii., 929.
11. Flexner, S., and Amoss, H. L.: Jour. Exp. Med., 1919, xxix., 379.
12. Osgood, R. B.: Trans. Amer. Orthop. Assoc., 1913–14, xi., 134.
13. Pasteur, W.: Trans. Clin. Soc. Lond., 1897, xiii., 143.
14. Aycock, L. W., Knapp, A. C., and Godfrey, E. S. (Jr.): Jour. Amer. Med. Assoc., 1926, lxxxvii., 635.
15. Aycock, L. W., and Eaton, P.: Amer. Jour. Hyg., 1925, v., 724.
16. Wickham, I.: Acute Poliomyelitis, Nervous and Mental Disease, Monograph Series, No. 16, N.Y., 1913.
17. Keeley, C. G.: Arch. of Pediat., 1917, xxxiv., 32.
18. Aycock, L. W.: Amer. Jour. Hyg., 1927, vii., 791.
19. Dingman, J. C.: N.Y. State Med. Jour., 1916, xvi., 589.

HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET.—Since the appeal in 1930 for the means to provide a new nurses' home, over £70,000 has been received, but a further £19,000 is still required. The present home has become so inadequate to the accommodation of the 105 nurses that many of them are sleeping three in a room. The new block will have 156 bedrooms and 25 bathrooms; each nurse will have a separate room. When the new home has been paid for consideration will have to be given to a great scheme of improvement which is estimated to cost half a million.

THE CONGRESS OF OBSTETRICS AND GYNÆCOLOGY

BIRMINGHAM, APRIL 5TH–7TH, 1933

Prof. BECKWITH WHITEHOUSE presided over the ninth British Congress of Obstetrics and Gynæcology, which was held at the University of Birmingham last week. He welcomed as official guests Prof. Oskar Fraenkl of Vienna, Prof. A. H. M. J. van Rooy of Amsterdam, and Prof. Birger Lundquist of Göteborg. Dr. J. P. Hedley, Dr. James Young, Prof. James Hendry, and Prof. Leyland Robinson took the chair at various sessions.

Uterine Action and its Abnormalities

Mr. ALECK BOURNE, in opening a discussion on uterine action, pointed out that feeble contractions were the cause of many of the disasters of childbirth. For the child the long labour was a considerable risk. He had searched the records of over 4500 consecutive deliveries at Queen Charlotte's Hospital and had found 49 cases of genuine primary uterine inertia, in 13 of which the cervix was described as definitely rigid. The condition was not common, its incidence being 1 in 150 among "booked" cases, as against 1 in 18 among "emergency" cases. Inertia was not influenced by maturity or by the weight of the child; it was five times more common in primigravidæ, and malpresentation was not a predisposing factor. In this series there was an unduly high number of cases of albuminuria. The membranes ruptured prematurely in 30 out of the 49 cases, and this early rupture appeared to have some definite connexion with the inertia, though it might not necessarily be causal. Manual removal of the placenta was performed eight times. Sedatives had been employed in most of the cases, and in less than half the total was delivery spontaneous. In only two cases was manual dilatation of the cervix performed. The maternal mortality was 10 per cent. and morbidity 40 per cent.

Mr. Bourne showed a graph recording the intrauterine pressure at 36 weeks of pregnancy; after an injection of Pitocin the uterus contracted regularly, but the contractions were not felt by the woman, nor did the cervix dilate. He referred to FitzGibbon's observation on the importance of the engaging head and its pressure upon the cervix as the cause of the onset of labour. Non-engagement of the head was often associated with inertia. He had attempted, he said, to induce labour by injection of trihydroxy-œstrin in castor oil, but without success. The part played by œstrin in labour was not known. Finally he emphasised the part played by fear in causing weak contractions. A contented and care-free woman would usually have an easy labour, and one of the most important functions of the medical attendant was to obtain the confidence of the mother, especially during the antenatal period.

Prof. BLAIR BELL, Dr. M. M. DATNOW, and Dr. T. N. JEFFCOATE presented a paper on the mechanism of uterine action and its disorders. They had found that neither œstrin nor Antuitrin S. had any effect on the isolated uterus, and that no immediate effect was obtained by their administration to living animals. Œstrin appeared to cause the secretion of infundibulin in animals; it sensitised the uterus to respond to this principle, and assisted in bringing about hypertrophy and increased vascularity of the uterine musculature during pregnancy. The hormone of the corpus luteum inhibited uterine activity; but after the first two months it was not essential for the

maintenance of pregnancy in the human subject. The hormones of the anterior lobe of the pituitary might assist and might even replace those of the corpus luteum in causing inhibition. The view was expressed that primary uterine inertia is due to lack of sensitisation of the uterus by œstrin and to insufficiency of the pressor substances in the maternal blood. The onset of labour, and the occurrence of many cases of abortion, seemed to be associated with an excess of œstrin in the circulation. In abortion a large amount of œstrin was found in the urine with a disappearance of prolan B., whereas in cases of intra-uterine death near term, the urine gave a negative Aschheim-Zondek test but no excess of œstrin. In cases where corpus luteum and antuitrin S. were injected in the early stages of an abortion it had proved possible to avert the expulsion of the fœtus. Premature labour was usually due to powerful emotions through sympathetic stimulation as well as to fœtal influences. A few cases of primary uterine inertia had been treated by the administration of parathormone and small doses of infundibulin. In tonic contraction there was evidence of an increased amount of pressor substances in the blood and magnesium sulphate had an immediate inhibiting effect. Experiments were recorded which seemed to show that secondary uterine inertia was not due to muscle fatigue.

Dr. J. M. ROBSON had found that if strips of human uterus, removed at Cæsarean section, were exposed to the action of oxytocin there was no effect in the early months of pregnancy. On the other hand vasopressin caused contractions. If strips were removed late in pregnancy and treated with oxytocin contraction occurred with quite a small dose. Parturition strips required a minimal dose of oxytocin to produce a contraction. During menstruation there was no response to either oxytocin or vasopressin. Portions of muscle removed from the lower uterine segment during parturition required ten times as much oxytocin as those from the upper segment. In pregnant rabbits a strip of uterine muscle removed during the puerperium required 100 times as much oxytocin as a strip removed during pregnancy in order to produce the same contraction. After injection of œstrin the uterus showed marked reactivity to oxytocin. Corpus luteum inhibited this reactivity. There were two hormones elaborated by the corpus luteum; one acted on the endometrium, causing proliferative changes, and the other inhibited uterine muscular action.

Mr. WENTWORTH TAYLOR read a paper on the anomalies of uterine action. He described the lower uterine segment as the middle segment of the "birth sleeve." Before labour the walls of the uterus were of equal thickness throughout. Incoördinate contraction might be due to several causes—psychic, hormonic, or mechanical causes, antepartum infection of the liquor amnii or to the administration of oxytocic drugs. Sympathy of action between the various parts of the uterus determined normal labour. Spasm of the uterus was due to obstetrical interference. For this condition he advocated early trial of sedatives. In the presence of fœtal distress and tenseness of the uterus with little or no cervical dilatation, Cæsarean section was required.

Mr. WILLIAM GILLIATT read a paper on contraction ring of the uterus in labour. It was usually found, he said, at the level of the neck of the child in a vertex presentation or wholly below the presenting part. Details of 14 cases which had occurred in his practice were given. The condition was a serious one because it could never be foreseen, the diagnosis was difficult, and there was a predisposition to sepsis because of the concomitant intra-uterine manipulations. Premature rupture of the membranes and interference were the main points in the ætiology. Uterine inertia was not definitely associated with the condition. Parity and age had no influence. An important diagnostic sign was whether the head could be pushed on to the vaginal finger during a pain; if this was impossible contraction ring should be suspected. Sedative treatment was disappointing, but amyl nitrite in a dose of three minims had relieved the contraction in one case. Cæsarean section was the treatment of choice when the cervix was undilated and the risk of sepsis was slight. In this series he had performed it in 10 cases. The maternal death rate was 14.2 per cent. and the fœtal 20 per cent. Prognosis depended on early diagnosis and avoidance of introducing the hand into the uterus.

Mr. L. C. RIVETT thought that differences in the thickness of the uterine wall were the cause of irregular uterine action. In one case of rigidity of the os he had made small multiple incisions in the cervix, and was thus able to extract the child in half an hour. In other cases also he had done this with marked success.

Dr. D. READE emphasised the importance of the mental aspect and the rôle of the sympathetic nervous system. Complete mental and physical repose excluded the influence of the sympathetic and thus facilitated labour.—Prof. MILES PHILLIPS agreed with Mr. Bourne in his emphasis of the importance of fear. Antenatal administration of calcium was useful for increasing uterine tone. He deplored the conflicting statements in text-books in regard to uterine inertia, and thought that Herman was probably to blame for the erroneous definitions.—Mr. CHASSAR MOIR demonstrated graphs of uterine contractions at the seventh day of the puerperium. The contraction of the cervix was 15–17 seconds after that of the uterus. It appears, he said, that a wave of peristalsis passes over the uterus.

Mr. A. C. BELL did not like applying to human beings the conclusions derived from animal experiments. He said that adrenalin inhibited the uterus in labour. A mechanical factor played a definite part in causing anomalous uterine action.—Mr. BOURNE said he had used adrenalin in two cases in tonic contraction, and in one it had had no effect. He was of the opinion that tonic contraction was a myogenic spasm, whereas rhythmic contraction depended on a neuromuscular mechanism.—Prof. BLAIR BELL also laid stress on the emotional factor in human beings. In reply to Mr. Bourne, he said that œstrin in a purely crystalline form increased the reactivity of the uterus to pituitrin. Further investigation of the source of the lutein cells was necessary. It was peculiar that the corpus luteum, developing as it did from follicular cells, should have a different secretion. He had shown the importance of calcium on uterine tone.—Mrs. BERTRAM LLOYD and Mr. P. J. GANNER described a case of fundal rupture of the uterus in a 2-para, aged 26, during premature labour at the thirty-sixth week.

The Isthmus and the Cervix

Prof. OSKAR FRAENKL spoke on the anatomy, physiology, and pathology of the isthmus uteri. This was, he said, a well-characterised part of the uterus, which grossly belonged to the cervix, but in its mucous membrane approached the body; it might be recognised and limited nearly always by naked eye, but always microscopically. The mucous membrane of the isthmus was always thinner and contained less glands than the corpus, but thickening might be simulated by cystic dilatation of the glands.

The muscosa of the isthmus was much less able to respond to hormonal stimuli than that of the body. The premenstrual change might be shown in part in the glands, but very frequently the mucous membrane of the isthmus remained in a state of complete rest. However, the development of a predecidual compacta always failed at the premenstrual stage. Correspondingly in pregnancy no true decidua compacta developed in the isthmus. In pregnancy the isthmus took part in the formation of the uterine cavity containing the ovum. Its mucous membrane developed decidua, but more markedly in the spongy than in the compact layer. The isthmus was also less able to respond to pathological hormonal influences than the body. Hyperæmia due to disturbed ovarian function, which might lead to œdema and hyperplasia of the mucous membrane of the uterine body, in an overwhelming majority of cases stopped at the cranial extremity of the isthmus. Only exceptionally the isthmus mucous membrane developed a well-marked hyperplasia. Similarly, as a rule adenomyotic proliferation stopped at the anatomical internal os. The adenomyotic glands originated from the corpus mucosa, not from the isthmus mucous membrane. In cases of adenomyosis originating from the glands of the collum, the penetration of the cervix wall stopped at the histological internal os. In the greater proportion of cases the mucous membrane of the isthmus was unable to produce adenomyosis. On the other hand, endometritis spread from the cervix mucosa up to the isthmus and involved it. Tuberculosis also as a rule involved the isthmus. Against cancer of the body of the uterus the isthmus mucosa possessed a certain degree of resistance.

Prof. D. DOUGAL said that he would in the future pay more attention to this region of the uterus.—Prof. BECKWITH WHITEHOUSE said he had always been interested in the secretion of the uterine glands, and was convinced that it played a part in the embedding of the ovum.—Prof. BLAIR BELL pointed out that Chipman, 40 years ago, had noted that the uterine glands contained glycogen.—Prof. MILES PHILLIPS asked what was the relation of the finding of remnants of Gartner's duct in the isthmus?—Mr. NINIAN FALKINER suggested that the glycogen was reabsorbed from the uterine glands into the blood stream and thus reached the ovum.—Prof. FRAENKL in reply drew attention to the fact that glycogen was present in the connective tissue during the premenstrual phase as well as in the uterine glands.

Prof. G. I. STRACHAN presented a paper describing the main pathological conditions in the cervix. At puberty, he said, no great change took place in the cervix; it was the uterine body which enlarged and so altered the size ratio of the two parts. After the menopause, there was extreme cervical shrinkage, variable in amount and especially in time, and this was probably due to reduction of circulation. The epithelium retained its more or less normal characters to a late age. The hormonal effect of the ovarian secretions on the cervix was very slight. The relative amount of fibrous and muscular tissue present was not influenced to any degree by age. Trauma at normal labour could not be prevented and cervical wounds tended not to heal because of gaping and constant reinfection. It was probable that epithelial metaplasia rather than replacement was responsible for much of the epithelial appearances. Prof. Strachan referred to the great amount of shrinkage and atrophy occurring in a previously hypertrophied and infected cervix after the menopause, and the relationship of this to carcinoma. Cervical carcinoma was rare in association with procidentia; apparently the non-retention of irritating discharges, along with congestion, was the factor mainly responsible.

Cæsarean Section—Hydramnios

Mr. VICTOR BONNEY read the paper on Cæsarean section which appears on p. 796.

Prof. J. M. MUNRO KERR said he had rarely met cases in which hæmorrhage had been troublesome. He very much doubted whether Willett's forceps would extract the head after trial labour had been in progress for some hours. He deprecated eventration of the uterus.—Mr. RIVETT confirmed Mr. Bonney's experience and said that by using two Willett's forceps extraction of the fœtal head was facilitated.—Prof. JAMES HENDRY said he made a semilunar incision in the lower uterine segment. Eventration of the uterus was unnecessary. He had not encountered many cases in which hæmorrhage from the incision had been severe.—Mr. E. STACEY agreed with Prof. Hendry's technique. Bleeding usually occurred when the bladder was pushed down.—Mr. BONNEY in reply said that the reason he eventrated the uterus was in order to remove the blood which collected in the pouch of Douglas during the operation.

Mr. RIVETT described ten cases of hydramnios in which he had performed paracentesis. He had injected indigo-carmine into the amniotic sac to see whether it would be absorbed by the mother and thus excreted in the urine. The result was negative. Similarly, when insulin was introduced there was no appreciable reduction in the maternal blood-sugar. He thought paracentesis a rational method of treatment and that there was little risk attached to it.

Prof. MUNRO KERR mentioned that he had injected uroselectan into the amniotic sac for the diagnosis of placenta prævia, but 40 per cent. of the cases went into labour as a result of the injection.

Transverse Contraction of the Pelvis

Prof. VAN ROOY read a paper on the obstetrical significance of transverse contraction of the pelvis. He cited the case of a vertex presentation with good flexion, a pelvis showing no abnormalities, and a true conjugate greater than normal. Labour starts and the head remains floating, dilatation proceeds and delivery has to be assisted. On investigation of such a case after delivery, Prof. van Rooy has found contraction of the transverse diameter of the brim. It was a symmetrical contraction, and had received scanty notice. Digital examination and pelvimetry were of assistance in measuring the other diameters. He agreed with Whitridge Williams that the transverse diameter of the inferior pelvic strait could not be measured in a living woman. He suspected this contraction if the ileo-pectineal ridges were easily palpable, and the external measurements, especially the posterior superior interspinous, were diminished. Radiographic pelvimetry was a real advance in obstetrics; it was the only means by which one could measure satisfactorily the superior strait. He gave details of 43 cases in which labour lasted for 40 hours with good uterine contractions, there was delay in engagement of the head, instruments were applied, the true conjugate was greater than 11 cm., and the weight of the fœtus was less than 3500 g. He had radiographed the pelvic brim in these cases and in 44 per cent. there was a diminution of the transverse diameter by 1·5 cm. Radiography in these cases revealed a hyperplastic state of the sacral wings. It was an open question whether the condition was one of abnormal congenital ossification or osteo-arthritis of the sacro-iliac joints. The condition must always

be suspected if there was non-engagement of the flexed head in the absence of obstruction and when the true conjugate was normal. Only by X rays could it be diagnosed.

Prof. MUNRO KERR said he had seen transverse contraction of the brim in cases of congenital dislocation of the femora. Alteration of the flexion of the head by transverse diameter contraction might require Cæsarean section.—Mrs. R. H. B. ADAMSON had obtained great help from radiography, but insisted that the relation of the fœtal head to the pelvic brim was still of paramount importance.—Prof. DOUGAL emphasised the importance of collaboration between the antenatal and radiological departments.—Prof. W. FLETCHER SHAW described a case of transverse contraction of the pelvic brim which had occurred recently in his practice.—Prof. LEYLAND ROBINSON reminded the congress that his colleague, Dr. Roberts, of Liverpool, had devised a method of measuring the pelvis radiologically some years previously.

Anæmia of Pregnancy

Prof. LEONARD PARSONS and Dr. R. J. GITTINS read papers on the effect of anæmia of pregnancy on the fœtus. The milk of mammalians, they said, was deficient in copper and iron, and in their young this deficiency was made good by the utilization of copper and iron stored chiefly in the liver and spleen during intra-uterine life. Nutritional anæmia in infants could arise if storage is deficient, or if the postnatal supply is abnormally poor, or both; by prolongation of milk feeding; and in premature babies and twins. Mineral deficiencies affected the maturation of the erythron chiefly in its later stages. A series of cases of anæmia in mother and child had been studied and showed various combinations; apparently the mother could sometimes retain iron at the expense of her baby. Anæmia, often termed physiological, occurred during pregnancy especially during the later months; the usual view was that this was largely due to hydræmia, but Strauss and Castle had found a true hypochromic anæmia and gastric anacidity in some pregnant women who had taken a defective diet. Was the extreme restriction of protein during pregnancy, as advised by some, a contributory factor to anæmia in mother and child?

An attempt had been made to observe the effect on the babies' hæmoglobin contents by administering (1) dried yeast, (2) sterilized wheat germ, (3) iron, to three different unselected groups of women with a fourth group as control. This work was still in progress and only an interim report on 689 hæmoglobin estimations on 232 women and 142 babies was at present available. In the control group, 245 estimations during pregnancy showed curves very similar to those of Galloway (1929) and Strauss and Castle (1932). A mean value of 83 per cent. in the fourth month fell to 76 per cent. in the last three months. In the puerperium there was a steady rise from the second month to the sixth, when a level of 92 per cent. was reached; this corresponded with that of 52 female surgical out-patients, who did not appear to be anæmic. The babies showed a mean of 92 per cent. in the second month falling to 86 per cent. in the fourth month; this fall was strikingly less than that found by Dr. Helen Mackay. There was no difference between the babies of primiparæ and multiparæ, or between breast and artificially fed babies. The figures of the mothers to whom yeast or wheat germ was given for two months or more during pregnancy were very small, but the babies had not, so far, shown any increase in hæmoglobin content. The mothers who took iron for more than two months during pregnancy regained a normal level of hæmoglobin in the puerperium more quickly than the controls. A few women were examined a second time during pregnancy and showed a rise in hæmoglobin in every case but one. Their babies were at a higher level in the second month, but fell to the same level in the fourth month. A selected group was composed only of women that had started taking iron in the fourth and sixth months, and though almost half had taken it for only short periods, this group showed slightly better results than the whole iron group.

It appeared probable that the anæmia of pregnancy was largely physiological, and probably due to hydræmia, but the above results suggested that it was not entirely so. Probably in a large group of women some required iron. It might be assumed that a good quantity of iron was desirable in the diet of the pregnant woman.

Prof. LEYLAND ROBINSON emphasised the importance of liaison between the pædiatrician and obstetrician.—Prof. C. G. LOWRY uttered a warning against excessive meat restriction during pregnancy.

Cancer of the Cervix and Radium

Mr. R. G. MALIPHANT read a paper on the Histological Classification of Cancers of the Uterine Cervix, and the relationship between Cellular Structure and Prognosis after Radium Treatment. It was based on 236 cases treated with radium. In classification Martzloff's method was adopted, in which the grouping was based solely upon the microscopical appearance of the individual cells of which the main mass of the neoplasm was composed. In solid carcinomata of the cervix three fairly distinct types of cell could be recognised. All three types were present in most of the cancers—only 21 per cent. of the growths were pure. The usual finding was, therefore, a mixed cell growth, and in these cases the classification was made on the predominant type. Ten of the 236 growths (4·2 per cent.) were adenocarcinomata, and of the remaining 226 solid cancers 30·9 per cent. belonged to the highly differentiated spinal-cell group, 13·3 per cent. at the other extreme belonged to the spindle-cell group, while there was a large intermediate group (55·8 per cent.) in which the tumour was mainly composed of transitional cells. Response to radiation had been studied from two standpoints, first the immediate attempt of the ulcer at healing, and secondly the three-year survival-rate which was taken as an index of cure. The latter had been studied in a group of 151 cases. Complete healing within three months of treatment had been taken as the criterion of a satisfactory immediate reaction to radium. The histological type which exhibited the best immediate response to radiation was the spindle-cell cancer, but when the three-year survival-rates were examined, the differences shown were too small to be of much significance. The analysis showed, however, that the spindle-cell cancers, though apparently the most malignant type, gave as good if not better results with radium than the more benign spinal-cell growths. This unusual experience of obtaining the best results with the more malignant, growth was possibly accounted for by the fact that the spindle-cell cancers, though the most malignant, were also the most sensitive to radium. Two of the seven patients with adenocarcinomata of the cervix treated more than three years ago were now alive and did not show any evidence of the disease. Mr. Maliphant concluded that in this series of cases, though histological examination of the tumour would have supplied

some information with regard to its radiosensitiveness and immediate response to treatment, it would have been of no assistance in arriving at the ultimate prognosis.

The Ureter in Pregnancy

Dr. DUGALD BAIRD described a method of studying the tone of the human ureter during pregnancy. A catheter was inserted into the ureter, of such a size that it fitted accurately the ureteral orifice. The catheter was then connected up to a water manometer, and the height of a column of water which it would support was measured. The pressure was then lowered to a point at which the optimum function of the ureter was expected, and the rapidity with which it expelled known quantities of fluid was estimated. This was charted graphically by a simple volume-recorder and drum. The observations were usually begun with the catheter above the pelvic brim, and in the course of observation it was pulled into the lower part of the ureter. The effect of the pressure of the uterus at the pelvic brim was thus studied. The tone having been estimated, the patient was now examined by chromocystoscopy and by intravenous pyelography to determine whether stasis was present. By correlating the findings from all sources one obtained some idea of the tone necessary to prevent stasis and of the pressure exerted by the pregnant uterus in each case. In albuminuria of pregnancy there was good ureteric tone. This was probably due to an excess of secretion from the posterior lobe of the pituitary.

Mr. MALIPHANT asked whether postural controls had been done in the non-pregnant woman.—Dr. H. C. H. GREER said he had seen cases of pyelitis and pre-eclampsia occurring in the same patient.—Mr. J. HEWITT said that true pyelitis and true toxæmia of pregnancy coexisted in the same patient.—Prof. HENDRY said that this work was an important contribution to obstetrics.

On behalf of Dr. E. CHALMERS FAHMY, Prof. R. W. Johnstone read a paper analysing 1000 cases of post-menopausal hæmorrhage reported from the Edinburgh medical school.—Dr. ERNEST BULMER made a short communication on osteomalacia, and Mr. A. A. DAVIS one on the innervation of the uterus. He had never, he said, seen nerves entering the epithelium of the body of the uterus, but he demonstrated by special staining a thin layer of nervous tissue just beneath the squamous epithelium of the cervix.—Mr. FRANK COOK joined issue with the speaker on the question of the parasympathetic supply to the uterus.—Mr. W. C. W. NIXON said he had noticed, using Sheridan's stain, a subepithelial layer of elastic tissue in the infravaginal portion of the cervix.

The scientific sessions of the congress closed with a vote of thanks, moved by Mr. T. G. STEVENS, to the University of Birmingham.

LONDON OPHTHALMIC HOSPITALS.—At the annual meeting last week of the Royal London Ophthalmic Hospital it was stated that the rebuilding scheme just begun will cost £90,000 and will employ 100 men for nearly two years; £30,000 of this amount has still to be raised. The extension will include a larger and reconstructed out-patients' department, new and enlarged laboratories, an enlarged medical school, a chapel, additional private wards, and more accommodation for additional nurses.—Last year the Western Ophthalmic Hospital met its expenses and, thanks to legacies, the debt on the new building has been reduced from £12,000 to £4500. A casualty ward has become highly desirable in consequence of the marked increase in the number of accidents from a distance due to the extension of the industrial area along the Great Western and Metropolitan Railways.

RECENT STUDIES OF VACCINATION

THE advances in the study of vaccination since the publication of the two reports (1928 and 1930) of the Rolleston Committee are reviewed by Dr. O. K. Wright in a recent article[1].

THE VIRUS

It is now generally accepted that the inclusion bodies described by E. Paschen and known by his name are actually the virus of vaccinia. J. C. G. Ledingham (1931) found that suspensions of Paschen bodies were agglutinated by high dilutions of immune serum but not by 1 in 5 normal serum, and E. G. Nauck and Paschen (1932) adduce amongst other reasons for the acceptance of the Paschen bodies as causal the fact that on repeated subculture of the virus in tissue cultures the increase in the number of these bodies coincides with the increased virulence of the virus.

A number of workers, in recent years, have cultivated the vaccine virus in vitro, in small quantities, but K. Herzberg (1932), using chick embryo in Tyrode's solution, has succeeded in producing a litre of bacteriologically sterile vaccine from one egg. Ordinary lymph is usually collected from the calf on the fifth day, but Paschen and others prefer the second day for collection because although the lymph then obtained is less in quantity it is more free from extraneous organisms, of better keeping quality, more potent and therefore capable of higher dilution. After trituration and dilution of the pulp with glycerin the lymph is stored at a temperature below freezing point until the extraneous organisms have fallen to a level sufficiently low for its safe issue. It remains so stored until the actual time of issue which may be as long as three years after preparation. According to H. Hackenthal and L. Schönberg (1931), the effect of the glycerin is to inhibit the growth of, rather than kill, the extraneous organisms by altering the organic constituents of the lymph. L. A. Silber and E. I. Wostrouchowa (1932) claim that by treating the raw pulp with carbolized water (Gins's method) and substituting buffer sugar solution for glycerin as a diluent a thermostable lymph ready for use can be prepared in a few days.

THE SKIN REACTION

The Rolleston Committee deprecated the old method of insertion by multiple scarifications and advocated either a single linear scratch of an eighth to a quarter of an inch, which M. D. Mackenzie found resulted in fewer admissions of recruits to hospital, or multiple pricks with the needle point over a small circular area. The experience of S. F. Dudley and P. M. May (1932) was that the latter method "resulted in a nearly threefold fall in the vaccinia morbidity and a halving of the days of sickness attributed to vaccinia" amongst the boys at Greenwich Hospital school. It has long been realised that the duration of immunity to vaccinia wanes with time and that periodical revaccinations are necessary to maintain full immunity. It would appear from some observations of A. Sergent and F. Trensz (1932) that loss of immunity, as judged by successful revaccination, may occur in as many as two-thirds of the previously vaccinated within three years.

In judging the results of vaccination V. A. Müller (1932) considers that a traumatic reaction is not a proof of immunity but only of a failure in technique. He classifies the results of vaccination, which should be read on the fifth day, as the pustule reaction of

[1] Bull. of Hygiene, March, 1933, p. 167.

the non-immune, the vesicular reaction of the partially immune, and the papular reaction (Pirquet) of the immune. The partial immunes of the second group may contract mild attacks of smallpox. By the simultaneous use of living and dead virus N. E. McKinnon and R. D. Defries (1931), were able to show that the early reaction which occurs in some subjects after vaccination is due to sensitivity and is an indication either of previous vaccination or smallpox. The two factors of sensitivity and immunity are independent. The early reaction therefore gives no reliable immunological information. This is only to be obtained by inspection of the vaccination from the fifth day onwards.

The intradermal method of vaccination has its advocates, but it necessitates the use of a bacteriologically sterile lymph and leaves no evidence of a successful result in the form of foveated scars. P. Durand and E. Conseil (1932) have studied the significance of the skin reactions which may appear after intradermal vaccination. They find that the reaction is always negative in an unvaccinated subject who has not had smallpox. Experience of the virus, whether in the form of vaccinia or an attack of smallpox, results in a positive skin reaction which they consider indicates not a sensitisation to the virus but an immunity to it. Thus in a doubtful case of smallpox, a negative reaction changing in the course of the illness to positive would indicate a diagnosis of smallpox in the absence of vaccination.

J. Craigie and W. J. Tulloch (1931), have carried out further work on the "flocculation" test and on high titre immune flocculating serum. The former, which is a precipitation rather than an agglutination, is of definite diagnostic, the latter of definite prophylactic value. According to C. R. Amies (1932), there is a difference between the agglutination test and the flocculation reaction. Although vaccinia and variola share a common antigen, separate agglutinins are produced in the body in response to these two viruses.

ENCEPHALITIS

One of the main purposes of the Rolleston Committee was to consider post-vaccinal encephalitis. The committee came to the tentative conclusion that "the coöperation of vaccinia with the virus of poliomyelitis or of encephalitis lethargica or possibly some unknown neurotropic virus must for the present be retained as a working hypothesis." Several workers, notably Ricardo Jorge (1931), believe, on the contrary, that vaccinia is the direct cause of the encephalitis. Jorge bases this opinion upon the constant incubation period, the cure by anti-vaccinia serum (Horder), the presence of the virus in the tissues and the occurrence of experimental encephalitis. Some associate the condition with the use of rabbits for the reinforcement of the strain, but Paschen points out that the condition has occurred after the use of lymph prepared without the intervention of rabbits, after slight reactions, and after intradermal vaccination. C. Kling (1932), has also shown that the incidence of encephalitis has no relation to the intensity of the vaccinal reaction, and O. Kudelka (1932) that cases have followed vaccination by the intradermal route. The causation and prophylaxis of post-vaccinal encephalitis must therefore still be considered as unsolved problems.

VICTORIA HOSPITAL, BURNLEY.—A bazaar recently held on behalf of this institution has realised £13,000. There is a debt of £6000 on capital, and £3000 on maintenance, accounts. The present year's requirements exceed those of 1932 by £6000.

MEDICINE AND THE LAW

Judicial Disregard of Inquest Verdicts

A COUNTY court judge's disparagement of the verdicts of coroner's juries lately drew a vigorous defence of them from a coroner. Laymen must often be puzzled by judicial disregard of the results of a coroner's inquiry. A coroner's jury finds X guilty of murder, but X is not on that account hanged. It finds Y guilty of criminal negligence amounting to manslaughter, but the dependants of the deceased cannot use that finding in a civil court afterwards; they cannot cash it in the form of damages but must prove their case independently. In Grime *v.* Fletcher (1915), Swinfen Eady, L.J., said that a county court, on a question whether a workman had met with an accident in the course of his employment, was quite right not to rely on the coroner's jury's verdict of suicide during temporary insanity. "It is common knowledge that coroners' juries take a compassionate view of such cases, the effect of which is to ensure Christian burial." In the similar case of Bird *v.* Keep (1918), the same judge, then Master of the Rolls, observed in the Court of Appeal that an inquest verdict amounted to no more than an expression of opinion by a coroner's jury about the cause of death upon the evidence before them. This was a war-time case, where a bomb dropped by German aircraft caused the death of an employee in an oil and colour factory. In subsequent proceedings under the Workmen's Compensation Acts it was a question whether the accident arose out of the man's employment. The coroner attended at the county court and offered to produce the record of the inquisition, but this was rejected. The coroner was ready to tell the court that a doctor had been a witness at the inquest as to the cause of death, and that the doctor had since died. Objection was taken and the coroner was not allowed to give the evidence. The Court of Appeal said the evidence was rightly rejected. The result of a coroner's investigation, however valuable for certain purposes, could not in law be treated as prima facie evidence against any person of the facts found by the coroner's jury. As the Master of the Rolls pointed out, the law used to be different; it had been thought the finding of a coroner's jury was conclusive at any rate in cases of suicide; and in Victorian times in insurance litigation arising out of the execution of Palmer, the Rugely poisoner, the coroner's inquisition was put in evidence without objection. It seems, however, that even the consent of the opposite side will not overcome judicial hostility to the admission of such evidence in non-criminal cases. In Calmenson *v.* Merchants' Warehousing Co., there was an appeal from an Irish court to the House of Lords—not, by the way, to the Privy Council as stated in Jervis on Coroners where the plaintiff's name is given as Calminster. In the Irish proceedings the two parties had agreed that the depositions in the coroner's court should be used, and that this documentary evidence should be supplemented by a further oral examination of the same witnesses. The House of Lords did not like the mixture. Lord Dunedin explained that the primary object of an inquest is not to fix responsibility on anyone; the parties to any subsequent legal action are not necessarily represented at the inquest and attention is not directed by examination and cross-examination to many points which may be important in the subsequent action. In his opinion, although evidence given at an inquest may properly be used

for the purpose of cross-examining a witness during a subsequent action, "the expression of opinion of the coroner's jury, even if it touches the question of responsibility, cannot be made evidence in the action by any admission." This high authority was followed in the same year (1921) by Mr. Justice McCardie in Barnett *v.* Cohen, where the plaintiff's counsel vainly tried to get the court to receive in evidence the statements made by witnesses before the coroner and the verdict and rider of the coroner's jury.

Although non-criminal tribunals pay so little attention to what goes on at an inquest, the coroner is nevertheless obliged by Section 4 (2) of the 1887 Act to write down the material statements of the witnesses where the inquest is dealing with a case of murder or manslaughter. These statements, to be signed by the witnesses and the coroner, can be used in a civil action as ammunition for cross-examining counsel. Their availability at a criminal trial is well explained in the notes to Section 5 of the Act in Jervis on Coroners.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

THE DOWNFALL OF GREEK CIVILISATION

In an article, written shortly before his death for the *Magyar Hirlap*, Sir Ronald Ross put forward the interesting theory that the downfall of Greek civilisation was due to malaria. He described how, many years ago, on the invitation of the Greek Government, he made an expedition to investigate conditions in the district round Lake Kopais, then a malarial swamp, and found that a third of the whole population, and nearly two-thirds of the children, had this infection. The breeding-place of the mosquitoes was traced to a neighbouring spring which is traditionally supposed to be the haunt of the three Graces, but where he found, besides the mosquitoes, only washerwomen, pigs, and geese. Sir Ronald said he considered this episode typical of the ravages wrought by malaria and he thought that the decay of Greek civilisation should be attributed to the inroads made by such a disease on the vitality of the people rather than to any sudden invasion or internecine warfare. He emphasised the danger for Greece of an insidious disease such as malaria, which had taken a firm hold on the people before anyone realised its presence, which attacked the children rather than the adults, and the fair-haired Greek stock rather than the dark-skinned barbarians, thus causing a steady drain on the vitality of the best youth of the country.

In support of this view Sir Ronald pointed out that it is historically established that malaria was introduced to Rome from Greece by the mercenaries of Sulla and Marius, and suggested that the malaria may originally have been introduced into Greece from Africa or Asia by slaves. He cited a parallel in the islands of Mauritius and Réunion whose populations were exterminated by a malarial infection from an external source. In conclusion Sir Ronald said that, though of course at this late date no definite proof could be given and all theorising must be largely conjecture, his observations in Greece had convinced him that diseases such as malaria, typhoid, and dysentery had played a far greater part in the history of the world than was generally supposed.

REARRANGEMENT OF THE MEDICAL CURRICULUM

Under the arrangements newly made by the University of Bucharest the professorial board meets at the beginning of every school year in order to fix the number of first-term students, according to the accommodation available in clinics and lecture rooms. If there is an excess of applicants, those are selected who have good records in natural science. The period of study in the medical department has been fixed at six years, and participation in hospital practice will be obligatory from the seventh to the twelfth semester. Examinations are held twice a year, in June and October, the ones in the autumn being reserved for candidates who fail in June. Those failing in two or more subjects will repeat the semester's work. The final examinations can be taken only after the successful completion of the sixth year, and each candidate must in addition write a thesis on a medical subject selected by himself, and approved by the professor under whose control it was prepared. Future specialists must now spend a whole year in special study, the subjects of the specialties being surgery, public health, forensic medicine, microbiology and experimental medicine, obstetrics and gynæcology, dermatology and syphilology, urology, psychiatry, neurology, ophthalmology, otorhinolaryngology, radiology, balneology, physical therapy, and dentistry. At the end of the specialist year the candidate must pass an examination and prepare a dissertation. On the strength of this he is accorded the title of specialist and is given a diploma.

THE ECHINOCOCCUS IN EUROPE

Dr. Ferencz Lörincz and Dr. George Bodrogi, both of the National Public Health Institute, have written an elaborate treatise on this subject in the *Orvosi Hetilap*. They say that Mecklenburg and parts of Pomerania have always been regarded as the areas most affected by echinococcus, but this belief now needs correction. H. Toole, who studied conditions in Greece and made a comparison with Mecklenburg, found that in the Piræus and its neighbourhood one person in 1000 had an echinococcal infection, whereas in Mecklenburg the rate is only 1 : 3585. Moreover, while the population of Rostock (Mecklenburg's most infected city) shows a rate of 1 : 1370, in the province of Cephalonia the corresponding figure is 1 : 529. Echinococcal cysts have been found in 2·3 per cent. of autopsies in Athens, whereas in Rostock during the period 1861–1905 the percentage was 1·98 and in 1905–22 only 0·57. There are no authentic statistical data from Turkey, but according to the statement of responsible authorities the rate of infection is considerably higher there than in Germany. In Bulgaria Dikoff studied the conditions in Sofia and states that in 9770 post-mortems between 1900 and 1908 the echinococcus was the cause of death in 48, or 0·49 per cent. In 1922 out of 780 autopsies death in 7 cases was found to be due to echinococcus. R. Peicic has collected the cases in Yugoslavia during the latter ten years and finds 921 cases, including 241 from Bosnia and South Serbia. Slavonia, north-east Croatia, and north-west Bosnia appear to be immune, and this distribution Peicic associates with distance from Greece, which he regards as one of the most infected of European countries. As to Holland, Snapper published the following data: in Friesland in the period of 1911–15 there were 63, in Groeningen 22, and in Drenthe 3 cases observed in the surgical clinics. According to Dew, the disease is very rare in England.

In Hungary the data originate from Czirer, who analysed all the cases observed in the surgical clinics in 1917–27 and found that echinococcal infection accounted for 0·2 per cent. of the total. He made the important observation that echinococcal cysts are

much more prevalent among the rural than among the urban population, for among 13,087 persons examined post mortem at the Budapest St. Stephan Hospital they were seen in only 16 cases, whereas in 10,847 autopsies at the provincial hospitals, 26 cases were found. Moreover, some of those found at the Budapest hospital were from the country. Surveying the echinococcus statistics of all Europe, Lörincz and Bodrogi come to the conclusion that human infection is not more prevalent here than in countries to the west of us. Certainly conditions are better than in Yugoslavia, Dalmatia, Bulgaria, Greece, or Turkey. Nevertheless it would be advisable to take strong measures against the echinococcus here as elsewhere.

PARIS

(FROM OUR OWN CORRESPONDENT)

CANCER HOUSES ONCE MORE

Dr. A. Lumière and Dr. P. Vigne have made an effort to lay the ghost of the cancer house finally. It is a hardy perennial whose vitality they have tried to undermine by the statistical method, or rather a variety of it which they call the comparative method of statistical heterogeneous controls. Their observations, communicated to the Academy of Medicine on March 7th, are as follows. During 20 years in Lyon there were 6703 deaths from cancer exclusive of those occurring in hospitals and nursing-homes. How were these deaths distributed among the 23,258 houses in the town? During the 20 years under review there were 18,231 in which no death from cancer had occurred. There were also 3869 in each of which there had been just one death from cancer. The houses in each of which there had been two such deaths numbered 953. At the end of the list there were two houses in each of which there had been as many as seven deaths from cancer, and one in which there had been eight such deaths. Were these veritable cancer houses in the sinister sense conferred on them by current rumour, or were they merely the victims of the caprices of hazard? Without accurate knowledge of the numbers of the occupants of each of the houses of Lyon, it was impossible by direct calculation to estimate the incidence of cancer deaths in the population, and the desired information had therefore to be sought by studying the numbers of births, marriages, and deaths from all causes, house by house. The curves representing these three different factors were found to coincide, with great uniformity, with the cancer curve. As even the most fertile imaginations have not risen to the conception of houses endowed with peculiar procreative or connubial proclivities, this comparison would suggest that, in communities like Lyon at any rate, cancer is not house-tied in any ætiological sense. Dr. Lumière and Dr. Vigne were not, however, prepared to apply their findings unreservedly to houses in the rest of the country; and till it has been subjected to the same kind of test that Lyon has undergone, there is still a loophole for the cancer house cult.

BLOOD TRANSFUSION THEN AND NOW

The growing popularity of blood transfusion was statistically demonstrated on March 15th at a general Meeting of the Œuvre de la Transfusion Sanguine d'Urgence. Like so many other philanthropic undertakings in France, it is subsidised by the local authorities, in this case the Assistance Publique. With its headquarters at the Saint-Antoine Hospital, it supplies donors to the public hospitals in Paris, including the British and American Hospitals. In 1929 it provided 220 transfusions, and in 1930 779. During 1931 it provided 2038, and in 1932 as many as 3738, or more than an average of ten transfusions a day. In spite of these imposing numbers, the supply of voluntary donors has proved quite adequate to the demand.

This was certainly not the case in the early days of blood transfusion. In the *Archives de Médecine et de Pharmacie Militaires* for February, Dr. Baudet tells how, Wren having introduced this operation in England in 1664, Denis and Emmerets took it up in Paris two years later. The medical world was soon divided in pro- and anti-blood transfusion camps. The "pros" extended the indications for this treatment to rheumatism, gout, cancer, exhaustion from loss of blood, melancholia, and all those cases in which one or other of the digestive organs was deranged. The donors also showed a wealth of variety, calves and lambs competing with human donors. The choice between all these donors depended, of course, on the individual needs of the recipient. When the latter's blood was too coarse and thick he required the fluid and subtle blood of a calf or lamb; whereas the owner of blood which had become cold and numb needed warming up with the boiling and active blood of a vigorous young man. In spite of all this discriminatory finesse, Denis got into trouble. Having injected the blood of a calf into the veins of a lunatic, he was chagrined to find his patient dying under his hands. After rubbing the dead patient with all sorts of essences to cajole him back again to life, the operator is said to have offered the widow money as an inducement to her to retire to a convent and to conceal the death of her husband. She not only declined this bargain, but notified the authorities of the death "si peu naturelle" of her husband. By 1668 the reputation of blood transfusion and its operators had become so lurid that it was forbidden, under penalty of imprisonment, unless authorised by the physicians of the Faculty of Paris. Thereafter, blood transfusion enjoyed a long holiday.

COBRA VENOM IN CANCER

On March 14th, on behalf of Dr. Monaelesser, of New York, and Dr. Taguet, of Paris, Prof. Gosset presented to the Academy of Medicine a preliminary report on investigations conducted at the Salpêtrière since October, 1930. It had not originally been thought desirable to publish this communication so early, and last October a provisional step was taken by the depositing of a sealed report with the Academy of Sciences. Recently, however, publicity was given to the investigations of other workers in the same field. Hence the desirability of immediate publication of the studies conducted at the Salpêtrière where 115 cases of cancer in every stage of the disease have already been given injections of cobra venom. Though many of these patients were moribund when the injections were first given, and most have since died, the injections, it is said, almost always afforded relief. There were, indeed, some patients whose disease seemed to be arrested and others whose ulcers had cicatrised completely. But at present it seems to be the analgesic rather than any possible therapeutic action of cobra venom which offers a promising future.

HELP FOR THE MEDICAL VISITOR TO PARIS

With the advent of the summer travelling season, it may be opportune to remind the visitor who wishes to study medical problems that an institution exists for his special benefit. It is the Association pour le

Développement des Relations Médicales entre la France et les Pays Etrangers. It was started in 1920 by Prof. Hartmann, who still presides over its destinies with old-world courtesy and new-world efficiency. His assistant, Mademoiselle Huré, has been attached to this association for a dozen years, and her polyglot gifts enable her to be the unobtrusive advisor of the doctors of many lands who come to Paris with a thirst for medical knowledge much in excess of their familiarity with the French language. Visitors wishing to attend various lectures have only to give her their names and wants, supplemented by the necessary fees, and they find that all the formalities are attended to by her. The address of the Association is La Salle Béclard, Faculté de Médecine, 12 Rue de l'Ecole de Médecine, Paris VI. It is open from 9 to 11, and from 14 to 17, every day except on Saturday when the office is shut in the afternoon.

IRELAND

(FROM OUR OWN CORRESPONDENT)

HOSPITAL POLICY IN THE IRISH FREE STATE

THE text of the Public Hospitals Bill, 1933, which is to provide for the control in future of the proceeds of the hospitals sweepstakes, has not yet been published. The *Irish Press* has, however, printed what appears to be an inspired forecast of its chief provisions. According to this forecast, the existing Committees of Reference will give place to a hospitals commission which will survey the entire hospital system of the country as well as recommending the details of distribution of the money. The moneys will, in future, be held in a common fund, and not divided in the proportion of two to one to the voluntary and the rate-supported institutions. The fund will be in the hands of trustees appointed by the Government and under the control of the Minister for Local Government and Public Health, who will, in future, take the place of the Minister for Justice in regard to the sweepstakes. Grants will only be paid to hospitals which reserve a fixed proportion of beds for the poor. There will be power to allocate grants to preventive medicine and to research.

VIENNA

(FROM OUR OWN CORRESPONDENT)

TRANSFER OF MEDICAL PRACTICE

IN the course of drafting a manual of medical ethics, the problem of buying and selling a medical practice has lately received a great deal of attention from the representatives of medical corporations. Writing to the Vienna Aerztekammer the official council of the medical profession in Vienna, Dr. Becher deals with this problem and explains that the occupation of a doctor of medicine is quite distinct from that of a tradesman or artisan, in that it does not primarily aim at earning money, but rather at serving public health—a service involving much personal responsibility. Commercial ideas and commercial customs are, at least in continental circles, quite strange to medical thinking; although his work requires payment, the medical man is bound by his ethics to abstain from many acts which any business man or tradesman is quite justified in. The latter may sell his business or workshop; but the work of a doctor cannot be considered on the same lines. This opinion is also expressed in numerous papers by leading German students of law. Medical practice is inseparable from the personal activity of the doctor; it is extinguished with the death of the doctor. The doctor's "stock-in-trade" is his knowledge, his medical experience, and his health. None of these items can be transferred, neither can he transfer the confidence of his patients, who trust in him, to his successor. What really can be transferred is the place of practice, the outfit, and possibly the reputation. Opponents of the idea of selling a practice also point out that the desire to get the best price for a saleable practice would lead the seller to pay little attention to the medical qualities of his would-be successor. In Germany the transfer or sale of a medical practice is not encouraged, but not actually forbidden. The laws are not uniform in this respect in the different States. In Czechoslovakia such transactions are forbidden by the rules governing medical ethics, and public laws are strictly opposed to the sale. Also in Switzerland we find rules forbidding the sale of a medical practice, but transfer is possible under certain conditions. Of course, all these restrictions apply only to private practice. Contract or club practice can never be negotiated between medical men only, since there is always a third party to be considered. Restrictions to settling within a certain radius after giving over a practice can never be regarded as valid according to continental laws (decisions of German, Austrian, and Swiss law courts prove it), for every and any restriction to the profession of medicine is opposed to public interests. Dr. Becher concludes that Austrian legislation does not, expressis verbis, forbid commercial transactions with medical practice, but it is an unwritten law that such proceedings are unethical and they have been repeatedly declared so by the official medical bodies.

MEDICAL ARTICLES IN THE LAY PRESS

The Wiener Aerztekammer has again called the attention of the medical profession to the appearance in the lay press of articles dealing with the results of medical researches and studies, which are apt to mislead the public and encourage hopes that cannot be justified. Certain dailies are on the look-out for sensational articles of this kind, and produce them in such a way as to give the impression of revolutionary inventions. The press abroad, too, is influenced by these articles, which tend by their exaggerations to discredit the reputation of Austrian medical men and students. The Aerztekammer earnestly exhorts the profession to refuse information to the laity, even if the therapeutic achievement or the scientific result is beyond doubt trustworthy. Information will in future be offered to the daily press by the Aerztekammer or a committee of this body, in coöperation with representatives of the press.

MEMORIAL TO MR. CHRISTOPHER MARTIN.—It is proposed to endow a bed in the Women's Hospital, Birmingham, as a memorial to the late Mr. Christopher Martin, who was honorary surgeon to the hospital from 1890 until in 1920 he became consulting surgeon and vice-chairman of the committee of management.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS.—An adverse balance of £1700 on last year's working has brought the accumulated deficit to nearly £11,000, and overdue structural improvements have had to be postponed. The tower which has long been a landmark had become insecure and has been replaced by a dome.

PUBLIC HEALTH SERVICES

Medical Inspection in Secondary Schools

IT might be supposed that children are liable to much the same troubles whether their parents have incomes of 20*s*. a week or £20, and that the work of the school doctor would be much the same in the secondary as in the elementary schools. Experience however shows the work to be very different, not only in detail but in scope and purpose. Many hygienic tasks which bulk largely in the elementary schools are almost absent with pupils of a higher grade. In the secondary school the doctor will not be concerned much with deciding whether children should be transferred to special schools for mental or physical defect, conditions due to dirt will be few, under-nourishment from poverty will seldom have to be considered. In many areas treatment clinics are regarded as unnecessary, for the parents are in a position to get treatment themselves; in Leicestershire, for example, "all defective children requiring treatment are advised, through their parents, to consult their own private practitioner." In other areas clinics are available for special defects, such as those of vision; at Sheffield, "treatment in the clinics is available for any pupil recommended by the principal of the school as a suitable case," and last year 289 children received treatment under this scheme, voluntary contributions being invited towards the cost. In any case, the securing of treatment does not fall on the shoulders of the school nurses and care committee workers.

At present the percentage of parents attending inspections is much smaller than at elementary schools; at Torquay "a few parents were present at the routine examinations, 82 attending in 1932 (compared with 97 in 1931). The difficulties of coming in from surrounding places, the fact that some of the pupils have been examined at the elementary schools, or the fact that all except 'entrants' have been examined previously at the grammar school, may account in part for the absence of the majority of the parents. But in any case there is never any difficulty in obtaining treatment for any defect, and the absence of parents would not seem to indicate indifference or lack of interest." Following-up visits are much less employed; in Leicestershire the only arrangement for following up defects discovered at routine inspection is the "reinspection of these children by the medical officer at his or her subsequent visit to the school." Special visits by the school nurse are not common anywhere. Refusal on the part of parents to allow their children to be inspected is sometimes a great trouble when medical inspection is introduced at a secondary school. The motive is not quite the same as that which actuates the parents of elementary school children, for with them there is apt to be an element of fear of being found out in neglect and of being put to trouble. With better-class parents it is often a kind of perverted pride, "It is my job to look after my boy's health and I don't need any help." Although the feeding of the necessitous may not arise, the character of the school meals is of the utmost importance, as it is undesirable for pupils who come from a distance to rush home at midday to bolt a meal, and sandwiches are rarely satisfying. Hence the provision of a good hot meal at a reasonable cost may mean much to the pupils, and it is the duty of the medical officer to impress its value on parents, especially when he is dealing with the less robust children who have won scholarships from elementary schools.

Other special features in the work of the medical officer at a secondary school arise from the fact that the standard of scholastic work is relatively high, and vigilance has to be exercised against over-pressure, not common except perhaps in these higher schools for girls which make a feature of preparation for examinations. It may be necessary for the doctor to study carefully both the routine and the curriculum of the school as well as the health and circumstances of particular pupils. Special care has to be exercised over children with increasing myopia; their home-work may have to be limited, sewing forbidden, or allowed only under favourable conditions—e.g., coarse work in good light. With the large amount of desk work there is also a tendency for postural defects to be common; fortunately at most secondary schools there is a well-qualified instructor in physical training anxious to work in sympathy with the medical officer. At Torquay, for example, "the physical training is very well carried out . . .; the difference in the physique, as the time during which the pupil has been at the school increases, is in many instances very marked. The staff are very enthusiastic to do whatever is best for the individual pupil, to try to increase physical fitness in the less robust, to avoid over-strain in the more healthy. It is realised that it is most essential to search for and find a proper adjustment of the phases of physical and mental activity . . ."

The Typhoid Fever Epidemic at Malton

The Malton Urban Council has replied to some of the points in the Ministry of Health's report on the outbreak of enteric fever in the urban district (see THE LANCET, March 18th, p. 605). Mr. C. C. Laverack, chairman of the council, has remarked (*Yorkshire Post*, March 17th) that the only danger foreseen in the late Dr. Bruce Low's report was that of surface pollution, and as far as he had been able to find out, that had been the position of all subsequent departmental inspectors. Three times during the last ten years the wells and pumps had been visited by experts from the Ministry. Twice their recommendations had been followed, but the advice tendered in 1926 to sink a new well was not carried out, as the council felt that such a well would probably tap the same springs. Last September, said Mr. Laverack, the Ministry's officials agreed that this decision was probably correct, and that the epidemic would have occurred whether the water had been taken from the suggested new well or the present one.

More recently, Dr. L. C. Walker, medical officer of health for Malton, has made a further reply (*Yorkshire Post*, March 30th), in which he deprecates the impression given by Dr. W. V. Shaw's remark that "during the week ended Oct. 15th the first case of enteric fever to occur in the Malton urban district this year was notified." This implied, said Dr. Walker, that cases were cropping up almost yearly, whereas there had been only five cases in the last 20 years, the last one in 1927. The case notified in the week ending Oct. 15th did not arise in the Malton urban district; it was imported from several miles away, as was also the second case notified. Dr. Walker says that the emergency measures recommended by Dr. Shaw at the special meeting of the council held on Oct. 26th had already been taken, with the exception of chlorination. The county medical officer of health, Dr. Mason, and he had visited the Malton institution on the day before Dr. Shaw's arrival, and had come to the conclusion that the only possible source of enteric fever was the case there.

It was not strictly accurate for Dr. Shaw to state that this patient was found on Sept. 26th to be suffering from enteric fever. It was Oct. 9th before a positive blood reaction was obtained and the case notified. In reply to Dr. Shaw's remark that this case was not removed to York isolation hospital until Oct. 26th, although an agreement was in existence between the Malton urban district council and the corporation of York for the admission of cases of infectious disease, Dr. Walker points out that it is "a regularly recognised medical procedure to treat typhoid cases in the general wards of hospitals where there is trained nursing available." Removal was talked over between Dr. Parkin, himself, and the master of the institution, and it was decided not to be necessary. Dr. Walker finds justification for this view in the fact that there were no secondary cases suggested as arising in the institution from contact with this patient, but only through the drinking water. "The fact," he says, "remains that if our water-supply had not arisen in close proximity to a broken drain the public would not have been aware of the presence in the institution of this patient, and there would have been no epidemic." Finally, in commenting on the impression given in the report that there had been remissness in the attitude of the council following Dr. Bruce Low's advice, Dr. Walker remarks that the report ignores any suggestion that the Ministry had been equally remiss in not having considered any other source of pollution except the river.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 1ST, 1933

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 18 (last week 17); scarlet fever, 2085; diphtheria, 773; enteric fever, 20; acute pneumonia (primary or influenzal), 1142; puerperal fever, 40; puerperal pyrexia, 107; cerebro-spinal fever, 43; acute polio-myelitis, 5; acute polio-encephalitis, 2; encephalitis lethargica, 11; dysentery, 20; ophthalmia neonatorum, 82. No case of cholera, plague, or typhus fever was notified during the week.

Scarlet fever in England and Wales was 33 per cent. above expectation; the other infectious diseases below expectation to the extent of, diphtheria 15 per cent., pneumonia 21 per cent., and enteric fever 52 per cent.

The number of cases in the Infectious Hospitals of the London County Council on April 4th–5th was as follows: Small-pox, 44 under treatment, 5 under observation (last week 51 and 1 respectively); scarlet fever, 1653; diphtheria, 1629; enteric fever, 12; measles, 314; whooping-cough, 651; puerperal fever, 26 (plus 13 babies); encephalitis lethargica, 234; poliomyelitis, 1; "other diseases," 376. At St. Margaret's Hospital there were 11 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 60 (1) from measles, 6 (1) from scarlet fever, 27 (4) from whooping-cough, 19 (7) from diphtheria, 39 (11) from diarrhœa and enteritis under two years, and 65 (7) from influenza. The figures in parentheses are those for London itself.

Ilford reported the only death from enteric fever. No great town reported more than 3 deaths from influenza. Eleven deaths from measles occurred at Liverpool, 8 at Birkenhead, 6 at Burnley, each 3 at Brighton, West Bromwich, and Rhondda. West Ham reported 3 deaths from whooping-cough, Liverpool 3 deaths from diphtheria.

The number of stillbirths notified during the week was 267 (corresponding to a rate of 42 per 1000 total births), including 47 in London.

CORRESPONDENCE

PART-TIME CONSULTANT AND SPECIALIST SERVICE OF THE L.C.C.

To the Editor of THE LANCET

SIR,—The London Voluntary Hospitals Committee, appointed under Section 13 of the Local Government Act, 1929, to act as liaison between the governing bodies and medical staffs of the voluntary hospitals of London on the one hand, and the London County Council on the other hand, passed the following resolution at their meeting on April 6th: "That this committee is of opinion that in the interests of the sick poor an amicable settlement of the dispute between a number of consultants and the London County Council is most desirable, and with that end in view offers its services to bring about such a settlement."

We are, Sir, yours faithfully,

RIDDELL, *Chairman.*
GEOFFREY EVANS, *Hon. Sec.*

London Voluntary Hospitals Committee,
23, Park-square East, N.W., April 7th, 1933.

To the Editor of THE LANCET

SIR,—I have read with interest the account of the meeting of consultants called to protest against the proposed conditions of appointment in the L.C.C. hospitals.

Criticism was directed against the method of appointment, amount of salary, holidays, and so on, but little was said about what appears to me to be the fundamental defect of the scheme. Apparently the consultants are to be engaged to attend for certain sessions, and to be paid wages at so much per hour, or occasionally at piece-work rates. Their responsibility would be limited to the period of the sessions; they would see such cases as were selected for them by the whole-time medical staff, or would be called in to operate like barber surgeons. This scheme seems to me to be a degradation of medical practice. Under the system which has proved so successful in voluntary hospitals, the consultant has charge of beds, and has clinical responsibility for his patients all the time they are in the hospital. Experience has shown that under these conditions the best relationship develops between patient and doctor. The same system, with some slight modifications to improve it, can easily be applied to municipal hospitals, and it will be very unfortunate if the L.C.C. gives a lead to the country in setting up an inferior method of administration.

I am, Sir, yours faithfully,

HENRY H. MACWILLIAM,
Medical Officer, Walton Hospital, Liverpool.
April 3rd, 1933.

CONTROL OF INFECTIONS IN CHILDREN'S WARDS

To the Editor of THE LANCET

SIR,—Dr. Donald Paterson makes several valuable suggestions for improvement of the present highly dangerous system of nursing young children in large wards. He rightly stresses the importance of ventilation, but his idea of calling in an expert on ventilation is, I am afraid, likely to end in disappointment. Many highly ingenious systems of natural and forced ventilation of hospital wards have been tried,

but none can compare with the effect of the full open air which can only be obtained in existing wards by constructing a wide verandah, on to which the beds can easily be wheeled from the ward each day. The ideal aspect for the verandah is south, but with most hospital wards built before the war this is impossible, and the eastern aspect is the next best choice. This, at least, provides for exposure to morning sunlight, and it allows for grateful shade in the open air, during the hot summer afternoons. The necessary complement of ward verandahs is easy-wheeling beds. The ordinary small castor usually provided on beds is useless. Excellent ball-bearing castors of 4-inch or 6-inch diameter can now be obtained at a reasonable cost. If these are provided the verandah will be used practically every day. If not, it will seldom be used, because the mechanical problem of moving the beds is beyond the capacity of the staff.

Another point of the greatest importance was mentioned by Dr. G. B. Fleming. In how many existing hospital wards are the nursing staff provided with adequate facilities for preventing the carriage of infection under practical working conditions? Two elementary necessities may be mentioned: (1) hand basins with hot and cold water laid on, and (2) convenient (e.g., steam) crockery, bowl, and instrument sterilisers. But even with these provisions the aggregation of young children in common wards will always be a risky proceeding, and their stay in a hospital ward should be reduced to the minimum required for the purpose. A poor home is often better and safer in convalescence than an "acute" hospital ward.—I am, Sir, yours faithfully,

H. STANLEY BANKS.

Park Hospital, S.E., April 3rd, 1933.

A WANDERING SPICULE OF BONE

To the Editor of THE LANCET

SIR,—A married woman, aged 53, came to see me complaining of pain in the hypogastrium just to the right of the middle line, about an inch and a half above the pubes. She described the pain as a sharp prick which was brought on by any sudden movement and which occasionally woke her at night if she turned in her sleep. She had no pain when she was at rest. She had noticed the pain for seven months, but it had been more severe recently. There had been no injury, and her past history shed no light on the condition. A small undefined swelling could be felt on the site of the pain, and appeared to be firmly adherent to the abdominal wall. There was no tenderness.

I explored the swelling through a paramedian incision. The rectus sheath appeared normal, but when it was opened a fibrous thickening in the muscle could be felt, although the superficial muscle-fibres did not seem to be involved. Examination of the deep aspect of the rectus muscle when it was retracted outwards showed a mass of fibrous tissue which was firmly attached to the peritoneum. A rounded mass could then be felt intraperitoneally and on opening the peritoneum I found a rounded cord-like structure running from the fibrous thickening in the muscle to the lower end of the great omentum. I detached its lower end together with a small piece of omentum and was about to dissect out the fibrous mass in the muscle when I felt a sharp prick and discovered a pointed spicule projecting from the detached end; I seized this with forceps and pulled out a very sharp piece of bone an inch long. When I had dissected out the fibrous mass in the muscle I found a similar spicule about three-quarters of an inch long which my manipulation had broken off. After the operation he patient had no further pain. The spicule was about one-sixteenth of an inch wide, flattened and slightly curved. On breaking it snapped like bone, and it blackened like bone on burning. Unfortunately it was thrown away before it could be sent to a pathologist.

As regards the source of the spicule, I find it difficult to come to a definite conclusion. There was no external scar visible and the rectus sheath was intact. I questioned the patient as to whether she remembered having swallowed a bone, but she was certain she had not done so, and the spicule was, I thought, rather long to have been swallowed without notice. Nevertheless I feel it must have got into the alimentary canal and have worked its way through the walls of the intestine or stomach. I have never heard of a similar case.

I am, Sir, yours faithfully,

E. HENRIETTA JEBENS, F.R.C.S.

Wimpole-street, W., April 1st, 1933.

THE ACRIFLAVINE TREATMENT OF BURNS

To the Editor of THE LANCET

SIR,—A reference to the use of boracic acid in burns prompts me to refer to the use of acriflavine for the same purpose. Any strength can be used and without pain. Nor need the burn itself be too much irritated by cleansing. After applying the acriflavine (say in a dilution of 1–800) a film shortly forms over the burn. No dressing need be used; the film is daily anointed with the acriflavine solution—a dry cotton-wool pad, not touching the film, is used. No reaction takes place in the wound, but the film (scab) increases somewhat in thickness and falls off in about ten days, leaving a marvel of healing. The epidermis is even with the surrounding skin which adjoining the burn is free from swelling or infiltration.

I am, Sir, yours faithfully,

W. ROBERTSON, M.D.

Mossel Bay, Cape Province, South Africa.

*** This letter came before the communication from Dr. Howard Mummery of March 25th. Both our correspondents provide testimony to the value of acriflavine, and it may here be recalled that the successful use of another antiseptic, gentian-violet, was described in an annotation on March 4th (p. 484).—ED. L.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Lt.-Comdrs. L. A. Moules to *Sandhurst*; R. J. M. Andrews to *Malaya*; F. W. Watt to *St. Vincent*; and E. G. Adams to *President*. Surg. Lt. P. N. Walker-Taylor to *Vivid*.

Surg. Lt. E. W. Bingham to be Surg. Lt.-Comdr.

Surg. Lt. W. D. M. Sim is placed on the retd. list.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Comdr. A. E. W. Hird, V.D., is placed on retd. list with rank of Surg. Capt.

ROYAL ARMY MEDICAL CORPS

Maj. D. G. Evans, h.p. list, is restd. to the estabt. with precedence next below J. A. L. Wilson.

INDIAN MEDICAL SERVICE

Lts. S. M. Kharegat and R. C. Dracup to be Capts.

Lts. (on Prob.) A. K. Gupta and H. M. Sein to be Capts. (on prob.).

The provisional promotions of Capts. (on prob.) J. Singh and K. Jilani are confirmed.

The seniority of Lt. (on prob.) D. R. Tweedie is antedated to 1st Feb.

Lt.-Col. H. P. Cook retired on Feb. 28th.

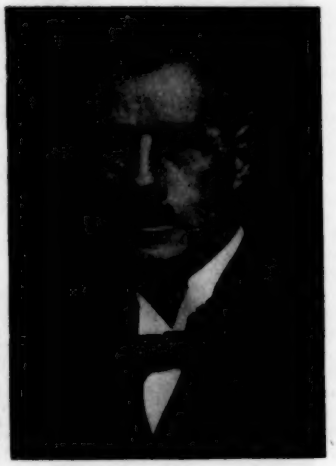
Capt. R. Chand relinquished his temp. commn. on Feb. 1st.

OBITUARY

JOHN HERBERT FISHER, F.R.C.S. Eng.

CONSULTING SURGEON, ROYAL LONDON OPHTHALMIC AND ST. THOMAS'S HOSPITALS

Mr. Fisher, whose death on April 4th was recorded last week, had suffered from progressive ill-health for the last few months but for the previous five years had keenly enjoyed in full bodily and mental vigour the leisure he had promised himself on retirement. His life had been an exceptionally strenuous one; he realised as a schoolboy that success in his case depended upon winning scholarships, and indeed kept himself from the age of 11. Since he was equally keen on work and games, and achieved signal success in both, his days were overfull during the early part of his life and his struggles to equip himself for specialist work and later to establish himself gave him a keen ambition to enjoy a life free from professional cares before he got too old to appreciate it. On his retirement from Moorfields in 1927 (he had resigned from St. Thomas's some years previously) he gave up his house in Wimpole-street and a large consulting practice, though he still lived in the doctors' area and kept in touch with many of his friends and former activities.



MR. HERBERT FISHER

John Herbert Fisher, the son of Ben James Fisher, M.I.C.E., was born in 1867 at Hillingdon, Middlesex, and was educated at Exeter School and St. Thomas's Hospital, where his record of scholarships and exhibitions was pursued. He entered St. Thomas's as a William Tite scholar and became also a Musgrove scholar and gold medallist. In 1894, having qualified M.R.C.S. in 1891 and taken his F.R.C.S. in 1893, he graduated M.B., B.S. Lond., with high honours in medicine and was university scholar and gold medallist in surgery. Among the three resident posts that he held at St. Thomas's was that of ophthalmic house surgeon and he remained attached to the medical school as demonstrator of anatomy until his appointment as assistant ophthalmic surgeon in 1901, the year after he had been elected to the staff of Moorfields Hospital. During the war Mr. Fisher served as captain in the R.A.M.C. (T.F.) and served at the 5th London General Hospital from 1915–19. In 1920 he was elected president of the Ophthalmological Society of the United Kingdom and in 1923 a member of the council of the Royal College of Surgeons of England, a post he held for eight years. In 1930 he delivered a Hunterian lecture for the College, choosing as his subject perforating wounds of the eyeball, and his Bradshaw lecture delivered before the College later in the same year dealt with ocular muscles, movements, and judgments. Both of these lectures were published in THE LANCET.

Mr. Fisher's shrewd outlook, lucid expression, and courteous manner made him sought after as an administrator. He was dean of St. Thomas's medical school from 1904–24; he held office as president of the Council of British Ophthalmologists, and as ophthalmic referee to the Civil Service Commissioners and Ministry of Pensions. This last appointment was the only one he continued to hold after his retirement from practice.

Herbert Fisher was author of a standard work on ophthalmological anatomy and various articles on the pituitary body. His wisdom and clinical acumen attracted many of his colleagues to bring cases to him in consultation. He was known as a sound ophthalmic surgeon, whose opinion could be relied on and whose technical skill was adequate to cope with any emergency. The courage and strength of purpose which he showed all through his career were an inspiration to many younger men, and his kindliness was apparent to all who worked with him. All through his life he suffered from severe recurrent attacks of migraine, causing at times some abruptness of manner which changed as if by magic to geniality when the attack passed off. When a young man Herbert Fisher had loved cricket and football—he played Rugby football for his county as well as for St. Thomas's—and his favourite recreation in his later years was golf, his handicap being low in the single figures. He was member and at one time captain of Northwood, and for over thirty years his annual holiday had been spent at Lossiemouth, where at the Moray golf club "Dr. Fisher" was a member for whom caddies held it an honour to carry clubs. The concentration with which he played was characteristic of all his activities; he was a difficult man to beat. In the summer of 1932 he seemed to his friends to show less vigour and a few months ago began the series of attacks of ill-health which culminated fatally.

Dr. H. G. Turney writes: "Fisher's original inclination was towards general surgery, but at the time there was no prospect of a vacancy on the surgical staff at St. Thomas's. This turned his attention to the ophthalmological department, then at the height of its fame under Nettleship and Lawford. So he became an ophthalmologist and from that day he never looked back. He was a brilliant operator and a skilled diagnostician; that he was a good deal more than this is shown by his report of the case of a boy who had lost the sight of one eye by injury while the other was in an apparently hopeless state, shrunken and degenerate as a result of sympathetic ophthalmia. With the sympathy rather than the approval of his colleagues Fisher interfered, and after efforts spreading over many years was able to restore a useful degree of vision. Here is evidence, not only of professional skill, but of originality and courage united with dogged perseverance. Fisher was remarkable for the breadth of his knowledge outside his own specialty; his contributions to our knowledge of the physiology and pathology of the pituitary and thyroid glands are of recognised value. He had high judicial qualities. He would have made a great if stern judge, and the writer has a vivid recollection of a truculent claimant for compensation being reduced, metaphorically, to a pulpy mass. Fisher had all the qualities that make for good administration and displayed them both at Moorfields and St. Thomas's. His last public appearance was when he took the chair at an old students' dinner at

St. Thomas's and made a speech admirable both as to delivery and matter, full of humorous and kindly recollections."

Mr. Fisher married in 1899 Euphemia Helen, youngest daughter of the late S. Dinwoodie, of Dumfries, who survives him with one son.

ALLAN OGIER WARD, M.D. Edin.

THE death was announced on March 25th at Crouch Oak, Addlestone, of Dr. Ogier Ward, a well-known London practitioner before his retirement, who had been particularly interested in life assurance work.

Allan Ogier Ward was born in Kensington in 1852, where his father Dr. Thomas Ogier Ward was in practice. His mother, a Miss Allan, was the daughter of the surgeon who accompanied the famous Sir William Edward Parry on his North Polar expeditions. Allan Ogier Ward was educated at Tonbridge and at Magdalen College School, with the intention of pursuing classics at Oxford, but various circumstances combined to alter this plan and he spent the first five years after his school education in a business career in London. Then the medical tradition in the family asserted itself, and he went to Edinburgh as a medical student and graduated there as M.B., C.M. in 1883, taking the M.R.C.S. Eng. in the same year. Three years later he proceeded to the M.D., having in the meantime done post-graduate work at Prague and Leipzig. He then went into general practice at Tottenham and later in the City of London, where in addition to the usual private practice he interested himself in life assurance work and became chief medical officer in England to the New York Insurance Company and principal medical officer to the British General Insurance Company. Then came a further period of general practice in Kensington, where the surgical side of his work possessed special attraction for him, and for this he was well equipped, having held appointments at the Throat Hospital in Golden-square, at St. Peter's Hospital, and the Royal Ear Hospital. He was also a trustee of the Florence Nightingale Fund, a governor of the French Hospice, and a member of the board of management of the British Home for Incurables at Streatham. He retired to his Surrey home in 1931, having earned in his career as a doctor the esteem and affection of his patients.

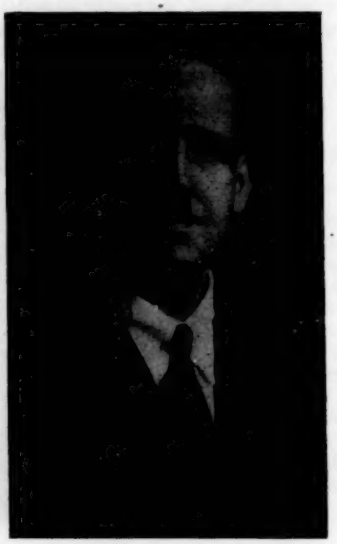
Ward was an unusually all-round man. He had entered the medical profession later than was usual, and despite his early bias towards surgery he found it necessary to enter into general practice at once. His early education in the classics no doubt assisted him to acquire his thorough knowledge of medicine, and gave him the kind of mentality that impelled him to keep abreast with the developing knowledge of medicine. They also impelled him to many other interests, and he acquired a considerable knowledge alike of astronomy, geology, and palæontology, when an excellent memory enabled him to discuss these large subjects from a firm standpoint with real authorities. As a young man he had a distinguished rowing career with the Thames Rowing Club, and he was an enthusiastic fisherman, a pursuit which led him, as so often happens, to manifest a close interest not only in fishes but in birds, insects, and plants. In fact throughout his life every branch of natural history was to Ward a source of enjoyment.

Dr. Ward married Leila Catherine, daughter of the late Dr. John Cox Lynch of Sudbury, Suffolk, and leaves a widow and one son, Mr. R. Ogier Ward. A daughter predeceased him.

PERCY THEODORE HUGHES, M.B. Edin., D.P.H.

MEDICAL SUPERINTENDENT, WORCESTERSHIRE MENTAL HOSPITAL

THE death of Dr. Percy Hughes on March 29th after a few days' illness will be felt by all those who shared his devotion to the care and treatment of the mentally afflicted. Born at Darlington in 1872, son of the Rev. A. H. Hughes, he was educated at Haileybury, going on to the University of Edinburgh where he graduated M.B. in 1894. At Edinburgh he was a hard and earnest worker, excelling also at football—he played for "The Wanderers"—and popular at musical gatherings for his fine baritone voice. After qualifying he was house physician at the Royal Infirmary to that inspiring clinical teacher, Alexander James, and was also resident surgeon at the Royal Hospital for Sick Children. But it was not very long before he became attracted to mental hospital service as a career and it was with a view to securing a vacancy at the new Bexley (County of London) Mental Hospital that he entered one of the Metropolitan fever hospitals and obtained in 1899 the diploma in public health. It was of course long before any diploma in psychological medicine was instituted among medical officers in mental hospitals. At Bexley his chief was T. E. K. Stansfield, and his senior colleagues Hubert Bond, F. Paris Piper, and John R. Lord. Hughes had an infectious enthusiasm and threw himself heartily into every effort to develop treatment on progressive lines; it was he who suggested a trial of various new forms of occupation which won fame for Bexley as an example of what could be done by systematic organisation.



DR. PERCY HUGHES

[Photograph by H. J. Whitlock

It was in 1906 that Hughes was appointed medical superintendent of the Worcestershire Mental Hospital which was then unfinished at Barnsley Hall and not opened until the following year. Both by his natural gifts and by his training and experience, Hughes was eminently fitted to carry out the task which lay before him. He was a capable organiser and administrator, and his personality won loyal support from officers and staff. The hospital was up to date when it started, but suggestions for improvement were constantly being considered and adopted if practicable. Hughes realised the importance of skilled nursing in the treatment of mental disease, and set out his views in a valuable article on mental nursing in "The Science and Art of Nursing" (Cassell). He loved good music, and took a keen interest in training and practising with the choir of the hospital chapel. He always did his utmost to promote the welfare and comfort of his patients, and he was rewarded by gaining their confidence and

affection. Under his leading Barnsley Hall was one of the first mental hospitals to possess its own permanent cinematograph installation.

Outside his own hospital work Dr. Hughes was lecturer on mental diseases in the University of Birmingham. He was always keen on the linking up of the medical and scientific work in mental hospitals with the universities, and it is common knowledge that his powers as a teacher were highly valued. Had he lived he would have taken full advantage of the out-patient treatment of mental illness and of the possible developments under the new Mental Treatment Act. He was an active member of the departmental committee, set up by the Board of Control in 1922 to inquire into hospital dietaries, the recommendations of which have done much to advance the health and comfort of mental patients.

Dr. Hughes married in 1911 Miss Emily Christabel Middlemore, daughter of the late Sir John Middlemore, sometime Member of Parliament for the old North Birmingham division. He is survived by his widow, two daughters, and a son.

THE DOCTOR'S DAY

"Come, tell me how you live," I cried,
"And what it is you do!"

XXIII.—THE OBSTETRICIAN

THOSE members of the obstetric staff of a hospital who really practise obstetrics are nearly always juniors. Their seniors usually have donned the title of obstetric consultant, for the majority, as soon as they are able, abandon some of their obstetric practice for the more ordered life of the gynæcologist. The keynote of the obstetrician's life is interruption. He, or she, is interrupted while sleeping, eating, working, or playing. Interruption is so constant as to become a routine. Within a few months the obstetrician no longer worries nor becomes in the least annoyed when he is interrupted. So prominent a place does interruption take in his life that it must take the prominent place in its description. The nature of his day's work demands the closest coöperation between himself and his secretary. Before he leaves the house in the morning he enters in the half-hour consultation book a detailed list of the proposed work for the day. The telephone number of each place of visit is noted also. His secretary then is able to find him at a few minutes' notice provided he on his part works according to plan or informs his secretary at once of any change. The obstetrician who is not conscientious in this respect places his secretary in an impossible position.

A LIFE OF INTERRUPTION

The work of the day before yesterday, though it was a little more strenuous than most, is typical of one in the life of an obstetrician. It started at 4 A.M. and the telephone announced that Mrs. A. had been in labour for seven hours and the pains were getting really bad. I take a passing taxi, for the house is no great distance away, and it is not worth getting the car out. The case, one of my booked confinements, is the equivalent of the physician's consultations and the surgeon's operations, but takes place at no set time. For it my presence may be demanded at any hour of the day or night. Should I fail to be available for even one or two cases the news will spread in a manner truly remarkable for so large a city as London, and my practice will suffer. The obstetrician, if he is wise, will arrange to attend his patients in their own homes only if they live within a reasonable distance from his own abode. He will persuade those who live more than four or five miles away to go to a nursing-home within a few minutes' walk of his house, or at least he will only agree to be present at the actual confinement on the understanding that the family doctor shall be asked to manage a long first stage of labour and be responsible for most of the visiting in the puerperium. Should the patients refuse to fall in with any of these stipulations the obstetrician will be happier if he refuses to undertake responsibility.

To return to the case in question, the patient is young and healthy and the labour is nearing the end of the first stage. I order some morphia and scopolamine and decide to stay, making myself comfortable on the drawing-room sofa. Nearly two hours later I am sent for as the nurse thinks she has seen some signs of "perineal pressure." This is correct and with the aid of a light chloroform anæsthesia and later a very low forceps application the head is lifted over the perineum and the baby born at 6.24 A.M. The exact time of birth is always noted and, for some reason or other, is always demanded by the mother and her relatives. I stay in the house until about 7 A.M., and return home in time to have a leisurely change, bath, and shave before breakfast.

At 9 A.M. I am at the medical school to give a lecture on the causes of maternal and fœtal mortality. I feel extremely guilty as I repeatedly warn the fifty or more students present of the greatly increased danger to mother and child entailed in the use of the forceps, when most of my own cases in primiparæ are delivered in this way. The lecture is over at ten and I spend the next fifteen minutes in the wards, seeing both obstetric and gynæcological cases and arranging an operation list for the next day. At 10.30 I arrive at an adjacent nursing-home and remove a uterus containing a number of fibroids. The task is difficult and tiresome, for the patient is fat and three years previously there had been an operation for gall-stones followed by a prolonged convalescence owing to peritonitis. This over, and after a welcome cup of coffee and ten minutes' gossip, I regain my consulting-room soon after midday, just a quarter of an hour late. I am thankful to have only three patients to see before the afternoon's work begins, and especially that two of them will not take long, as they are making antenatal visits.

NURSES AND COLLEAGUES

The obstetrician's work in his consulting-room is probably greater in amount than that of physician or surgeon. Apart from gynæcological and obstetric cases upon which his opinion is required, he sees his own patients at least once every month of their pregnancy and often more frequently. He has to cope with the usual accompaniment of relatives and occasionally a midwife or maternity nurse demands an interview. He soon recognises those nurses whose work is tnorough and reliable and who acquire the confidence of their patients. He learns to value especially those who have the power of managing their patients through the early stages of labour and do not call him unnecessarily; with these nurses he is anxious to work. The nurse in charge of the case I was called to early in the morning had thoughtfully not informed me at midnight that the labour had started, for she knew that the obstetrician could do nothing for the patient at this time and that his sleep would probably be disturbed if he was expecting to be called during the night. Alas! however, there is still a small but definite number of patients who choose their nurse first and their accoucheur second. The wretched obstetrician finds himself saddled with the entire responsibility of a case, nursed by an obviously inefficient midwife who, unfortunately for him, has acquired in the locality a wonderful reputation. A few such still remain who are consulted by their clients about a suitable medical attendant—let the obstetrician beware should such a case come his way.

Lunch and back at the hospital at 2 P.M. to conduct an antenatal clinic. Between 50 and 60 patients

have to be seen, but I am ably assisted by obstetric registrar and house physician. There are also ten students present and the next hour and a half is spent in teaching on cases as they appear. I am constantly interrupted by my assistants and asked to give a final judgment on some point. Smooth working of an obstetric department demands the greatest goodwill amongst its members; seniors and juniors alike must be ready and glad to replace each other and to do another's work at the slightest warning. Each member must be able to feel that without hesitation he can call on a colleague to take his ward round. The clinic being finished, tea is taken in the staff room.

At 5 P.M. I am due to meet a contemporary in general practice about ten miles away. I arrive to time and together we go to the case, a patient with advanced toxæmic albuminuria of pregnancy. She has been treated at home and as the condition is not improving arrangements are made for her transference to hospital in order that the pregnancy may be terminated. On returning home I have a few letters to write leaving me just time to take forty winks before dinner, which is slightly spoilt by two calls on the telephone. At 8.15 P.M. there is a meeting of the obstetric society to attend. A cup of tea at 10.30 and the evening paper are interrupted, again by the telephone.

ON THE DISTRICT

This time it is urgent. I am consultant obstetrician to a municipal borough. The doctor who has asked assistance has a patient who has been in the second stage of labour for six hours. He has tried to deliver with the forceps and failed. I set off and find a common cause for the obstruction—the baby is lying in a persistent occipito-posterior position. Manual rotation and the forceps deliver a large healthy male child who, with everyone else in the house, is delighted with the result. A word in passing about this call. A few boroughs recently have appointed consultant obstetricians and this scheme is so excellent as to merit special attention. A doctor practising in the neighbourhood finds himself in charge of a difficult forceps delivery, a breech with extended legs, or a retained placenta. Instead of having to rely on the good nature of a friendly obstetric specialist, or having to send the woman to hospital—he knows the moving is not good for her—or much against the grain attempting to deal with the situation himself, he can now call on the obstetric specialist to the borough knowing that his patients will not be expected to pay beyond their means, and that the consultant will not go entirely unremunerated for his trouble. To the obstetrician such an appointment is of great value. He can do a lot of good and at the same time lessen the strain on the overburdened obstetric hospitals, while the gratitude of patient, relatives, and doctor makes him feel that life is worth living. It is almost like going back to the happy days when he was a student "on the district." And so to bed, not nearly so weary as might be expected, for the day has gone well. The interruptions have not clashed with prearranged plans.

PROSPECTS

If I were asked about the prospects I should say that obstetrics is a branch of the profession which offers almost from the start a livelihood to the young specialist. In his early days his income is derived from his salary as registrar to the department, supplemented by fees for acting as assistant at operations, for visiting cases for his seniors in their absence, or for doing some of their work during the holidays. Sooner than he expects he may find he has begun to acquire a small practice of his own. Then comes the time when an important decision has to be made. Is he to become an obstetrician whose practice is of such a size that his hospital work becomes an intolerable burden or will he decide to limit his practice and, almost certainly, his income in order to attend to his hospital duties with some semblance of regularity? Should he attempt to do both the strain will be enormous and he will often find himself calling on his colleagues for help or leaving hospital work to the house physicians. Long association with the hospital and interest in teaching facilitate a decision. In hospital his work and teaching are criticised constantly, almost fiercely, by the students; whether he wills it or not he must keep abreast of the times and in touch with the practical, not just the theoretical, value of all recent work. His efforts at teaching are well repaid, for by the time the students reach the obstetric department they are nearing the end of their training and realise that here is a subject they must do their best to master. In their district work students are, for the first time in their career, entrusted with the responsibility of patients and this acts as a stimulus to the acquirement of knowledge. It is something to know that obstetrics is regarded by the student as one of the best, if not the best, taught subject in the curriculum. The work may be arduous but it is full of interest. The obstetrician must be available not only any hour of the twenty-four, but also any day of the week. Confinements occur on Saturday afternoons and on Sundays as often as on any other day. His patients fail to accept his absence at week-ends. His life therefore consists in a seven-day week until a time arrives, as it will sooner or later, when there is a pause. No babies are expected in the next fortnight or so. The obstetrician will then be well advised to hurry away for two or three days' complete change, leaving no address.

PARLIAMENTARY INTELLIGENCE

HOUSE OF COMMONS

WEDNESDAY, APRIL 5TH

Lung Disease Among Female Steel Workers

Mr. PIKE asked the Home Secretary whether his attention had been directed to the outbreak of a lung disease amongst female workers operating a process of chromium-plating stainless steel in Sheffield; whether he was aware that the medical officers who had examined the victims had expressed their belief that the disease was due to inhaling fumes of vitriol used in the process of plating; and if he would cause immediate inquiry to be made with a view to preventing a spread of this malady.—Sir JOHN GILMOUR replied: My attention has not previously been directed to this matter, but investigation is being made and I will inform my hon. friend of the result. If he has any particulars he can give me, I shall be glad to have them.

Miners' Welfare Fund

Mr. SPENCER asked the Secretary for Mines whether any decision had been reached in regard to the recommendations of the departmental committee of inquiry into the Miners' Welfare Fund.—Mr. E. BROWN replied: Yes, Sir. The Government have decided to accept the committee's recommendation that the amount of the levy should be reduced from one penny per ton to one halfpenny, and its duration extended for a period of twenty years. The necessary Bill will be introduced as soon as the state of Parliamentary business permits. My hon. friend will be aware that the committee recommend that the reduction in the amount of the levy should take effect at once, that is to say, in respect of the levy on the output of 1932. Under the existing law, however, this levy is due and payable on or before March 31st, and it is clearly necessary that the law shall be complied with. The Government will be prepared, however, to consider, in connexion with the amending Bill, how far practical effect can be given to the committee's recommendation regarding the 1932 output levy. The other recommendations of the committee, apart from that relating to the amount of the levy, are still under consideration.

Suicides by Gas Poisoning

Sir PERCY HURD asked the Home Secretary if his attention had been called to the increasing number of suicides from gas poisoning; and if he would institute an inquiry by experts into the possible chemical or other means of removing this means of self-destruction.—Dr. BURGIN (Parliamentary

Secretary to the Board of Trade) replied: The answer to the first part of the question is in the affirmative. As regards the second part, I would remind my hon. friend that this matter was investigated as recently as 1929 by the Departmental Committee on Deaths from Gas Poisoning, whose report was published in 1930.

THURSDAY, APRIL 6TH

Insurance of Injured Workmen

Mr. TINKER asked the Home Secretary (1) if he was now in a position to make a statement in respect of colliery owners and the insurance of their workmen for fatal and non-fatal accidents in connexion with the Workmen's Compensation Act, and (2) if he was now in a position to state what amendments to the Workmen's Compensation Act he proposed to make in regard to compulsory insurance for injured workmen.—Mr. HACKING (Under Secretary to the Home Office) replied: My right hon. friend does not at present contemplate any amendment of the Act in the direction suggested. As regards the mining industry, the information supplied by the Mining Association shows that in almost every area the Mutual Indemnity Associations have now made arrangements to insure the owners against all their liabilities under the Act excepting only payments due in disablement cases in respect of the first six months; good progress is being made in getting the firms to take advantage of such insurance. The chief exception is Lancashire, but I am glad to say that my right hon. friend is informed that a scheme has now been drawn up by a committee representing the two Lancashire Indemnity Associations and is being submitted to all the Lancashire colleries for acceptance. As regards those undertakings which prefer to do their own insurance, a model form of trust deed is being prepared which will provide for the maintenance of reserves adequate to meet all outstanding liabilities. Much, no doubt, remains to be done, but there seems to be good ground for hoping that the coöperation of the industry will enable matters to be placed on a satisfactory basis.

Medical Certificates and Industrial Diseases

Mr. ALEXANDER RAMSAY asked the Home Secretary if he was aware that workers contracting an industrial disease could not claim workmen's compensation without a certificate from the medical representative of the Home Office; that such certificate costs the worker 5*s.*; and whether he would remove this disability and place victims of industrial disease on the same footing as other insured workers who obtained medical treatment under the Health Insurance Acts.—Mr. HACKING replied: The Act provides in such cases that the workman must, unless the employer dispenses with it, obtain a certificate from the certifying factory surgeon. This system, which has been in force ever since the Act of 1906, is designed to prevent disputes between employer and workman by providing for certification by an independent doctor with special knowledge of industrial disease, and this would not, I think, be achieved if certification by the workman's own medical adviser were substituted. I would further point out with reference to the obligation on the workman to pay the fee that whereas under the Health Insurance Acts weekly contributions are paid by the workers, under the Workmen's Compensation Act the whole of the compensation is found by the employer.

Rates in Distressed Areas

Mr. STOURTON asked the Minister of Health if, in view of the urgent need for action, he would be in a position before the House adjourned for the Easter recess to make a statement as to the Government's intentions to relieve the depressed areas of the increasing burden of poor-law relief.

Mr. LAW asked the Minister of Health whether, having regard to the anxiety which was felt in many parts of the country as to the Government's policy, he was yet able to make a statement on the position of the depressed areas in relation to the burden of the poor-law rate.—Sir E. HILTON YOUNG replied: The matter is occupying the immediate attention of the Government. I am unable to say to-day when such a statement as that referred to will be made.

River Pollution in Scotland

Mr. HENDERSON STEWART asked the Secretary of State for Scotland when the report of the Scottish Advisory Committee on Prevention of Pollution of the River Leven, Fife, would be published.—Mr. SKELTON (Under Secretary of State for Scotland) replied: I understand that the committee hope to submit their report to the Department of Health for Scotland on April 11th. The report will be published as soon as possible thereafter.

MONDAY, APRIL 10TH

Aeroplanes and Carriage of Tropical Diseases

Captain CUNNINGHAM-REID asked the Minister of Health if he was aware of the warnings issued by the Ross Institute and the Institute of Micro-biology regarding the danger of diseases such as yellow fever being introduced into this country by mosquitoes in aeroplanes; and what steps he was taking in the matter.—Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Health, replied: Yes Sir. Carriage in aeroplanes of the infection of yellow fever has been carefully considered for several years by the International Office of Public Health and its Yellow Fever Commission. Proposals for dealing with this danger, and with other infectious diseases, are embodied in an International Sanitary Convention for Aerial Navigation which awaits ratification. My right hon. friend is advised that the danger referred to by my hon. friend does not apply to this country but to countries where yellow fever could develop if introduced.

Mr. LUNN: Is there not a danger of yellow fever being introduced in this way?—Mr. SHAKESPEARE: The danger is extremely remote. I am informed that the air liners of the Imperial Air Services have two breaks. The new machines start from Paris minus mosquitoes.

League of Nations and Vaccination

Mr. GROVES asked the Minister of Health whether his attention had been called to the misrepresentation of the English conscience clauses in the Epidemiological Report R.E. 131, issued by the Health Organisation of the League of Nations; and whether he would instruct the representative of this country on that organisation to take steps to have a correct statement of the English vaccination law published.—Sir E. HILTON YOUNG replied: I agree with the hon. Member that in the document to which he refers the effect of Section 2 of the Vaccination Act of 1898 is incorrectly stated, but as that section was repealed in 1907 and the substance of the enactment which replaced it is correctly reproduced, I do not think it necessary to call attention to the inaccuracy. These reports are issued solely on the responsibility of the Health Section of the Secretariat of the League of Nations, and not on that of the Health Committee of the League.

Medical Diary

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.1.
WEDNESDAY, April 19th.—8.30 P.M., at the MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mr. W. Ernest Miles: Abdomino-perineal Excision of the Rectum. Mr. A. Lawrence Abel: The Technique of the Surgery of the Sympathetic Nervous System (illustrated by cinema and epidiascope).
THURSDAY—4.30 P.M., at the MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Dr. Peter Kerley: Demonstration of X Ray Films.

ST. MARK'S HOSPITAL, City-road, E.C.
THURSDAY, April 20th.—4.30 P.M., Mr. C. N. Morgan: Surgical Anatomy of the Anal Canal and Rectum.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
WEDNESDAY, April 19th.—4.30 P.M., Mr. Kenneth Walker: Diagnosis and Treatment of Testicular Swellings.

WESTERN INFIRMARY, GLASGOW.
WEDNESDAY, April 19th.—4.15 P.M., Dr. J. Carslaw: Medical Cases.

Appointments

CONNELL, J. G., M.B. Camb., has been appointed Senior Resident Medical Officer, City of London Maternity Hospital.
DALZELL, A. C., M.B., Medical Officer, Sierra Leone.
DALRYMPLE, T. H., M.B., Medical Officer, Nigeria.
GEMMILL, WILLIAM, F.R.C.S., and LLOYD, BERTRAM ARTHUR, F.R.C.S., to be Medical Referees under the Workmen's Compensation Act, 1925, for the Birmingham County Court District (Circuit No. 21).
HALLINAN, Major T. J., M.B., Superintending Medical Officer, Jamaica.
MACK, E. S. E., M.B., Senior Medical Officer, Nigeria.
MACQUEEN, M. D., M.B., Medical Officer, Nigeria.
MANCLARK, R. A., M.R.C.S., Assistant Resident Medical Officer, City of London Maternity Hospital.
O'DRISCOLL, F., M.B., Medical Officer, Nigeria.
PRINGLE, L. D., M.R.C.S., Medical Officer, Hong-Kong.
STUPPEL, R., M.R.C.S., District Medical Officer, Cyprus.
WHITFIELD, A. T. D., M.R.C.S., District Medical Officer, Bahamas.
Certifying Surgeons under the Factory and Workshop Acts: WELCH, A. C., M.B., Ch.B. Leeds (Leeds West and Farsley District of the County of York); ROBINSON, V. P., B.M., B.Ch. Oxf. (Diss District of the County of Norfolk); JOHNSTON, OSWALD, M.B., Ch.B. Glasg. (Almondbank and Methven District of the County of Perth); and HICKS, E. W., L.R.C.P. Lond., M.R.C.S. (Wells District of the County of Norfolk).

MEDICAL NEWS

University of Oxford

The Theodore Williams scholarship in physiology for 1932 has been awarded to R. H. S. Thompson, scholar of Trinity College. The Radcliffe Travelling Fellowship has been awarded to Frank Hawking, B.M., who has been Theodore Williams scholar, Radcliffe scholar in pharmacology, and Gotch memorial prizeman. The Radcliffe prize for 1933, which is given for furtherance of medical science in the University, has been divided between Dr. R. S. Creed, Fellow and tutor of New College, and Dr. K. J. Franklin, Fellow and tutor of Oriel College.

University of London

Bayliss-Starling Scholarship in Physiology.—Application is invited for the Scholarship founded in memory of Sir William Bayliss and Prof. E. H. Starling. It is tenable at University College and its annual value is about £120, with exemption from tuition fees. The Scholar will be required to follow a course of study involving a training in the principles of, and methods of research in, physiology and/or biochemistry. The applications must be received by the secretary of University College not later than May 13th.

Pan-African Medical Conference

The Tanganyika branch of the British Medical Association has decided to organise a scientific meeting next January which will be held for four days at Dar-es-Salaam. The exact date will be fixed later. Invitations have been sent to the president and members of the following branches: Kenya, Uganda, Zanzibar, Nyasaland, Northern Rhodesia, Matabeleland, Mashonaland, Mauritius, and Union of South Africa. Representatives from the Belgian Congo, Portugese East Africa, and Madagascar have also been asked to attend.

Royal College of Physicians of London

At a meeting of the College on April 10th Lord Dawson of Penn was re-elected president. Lord Dawson was appointed to represent the College at the laying of the foundation-stone of the new buildings of the University of London in June next; Sir Francis Fremantle at the sixth Imperial Social Hygiene Congress; Dr. W. W. Jameson at the Congress of the Royal Sanitary Institute; and Dr. Rupert Waterhouse on the advisory committee of the British Health Resorts Association.

Diplomas in Ophthalmic Medicine and Surgery were granted, jointly with the Royal College of Surgeons, to the following candidates:—

A. J. Boase, A. J. Cameron, J. L. Connacher, K. G. Das, L. P. J. Evans, F. S. Flynn, G. S. Forrester, N. C. Ghosh, A. L. Kiow, Lu Djung-Lin, C. A. Pittar, V. B. Purvis, S. V. Rao, O. L. F. Senaratne, and S. P. Srivastava.

Royal College of Surgeons of England

A meeting of the council was held on April 6th with Sir Holburt Waring, the president, in the chair. The Jacksonian prize for 1932 was awarded to Mr. Harold Clifford Edwards, F.R.C.S., of King's College Hospital, for his essay on The Pathology, Diagnosis, and Treatment of Diverticula of the Large and Small Intestine. For the year 1933 the subject for the Jacksonian prize is The Pathology, Diagnosis, and Treatment of Localised Rarefying Changes in Bones as illustrated by Perthes' (or Legge's) Disease, Schlatter's Disease, Kümmell's Disease, and allied diseases, and for the year 1934 The Pathology, Diagnosis, and Surgical Treatment of the Various Forms of Splenomegaly. The John Tomes prize for 1930-1932 was awarded to Dr. E. Wilfred Fish for his original work in connexion with the physiology of the dental tissues. Mr. J. L. Honeywill of University College Hospital was appointed Begley student for the ensuing three years on the result of the recent examination in anatomy of the examining board in England.

Mr. C. H. Hough (Ambleside) and Mr. W. H. Dolamore (London), being members of 20 years' standing, were elected to the Fellowship. A diploma of membership was granted to Miss V. L. Liddell of Leeds University. Diplomas in tropical medicine and hygiene were granted jointly with the Royal College of Physicians to the following:—

D. R. Belletty (Middlesex), J. F. E. Bloss (St. Thomas's), Virginia M. Cobb (Columbia), A. C. Dalzell (King's College), B. P. Datta (Calcutta), R. T. S. Goodchild (London), R. Jeremiah (Ceylon), K. Kanagaretnam (Ceylon), C. C. Kapila (Rangoon), F. E. Lipscomb (Flt. Lt. R.A.F.) (Middlesex and Aden), I. A. Mohamed (Cairo), D. Nagarajan (Madras), J. P. Perera (Ceylon), B. H. Sayed (St. George's), L. B. E. Seneviratne (Ceylon), M. Shankhla (Leeds), A. R. Sikund (Punjab), G. R. Tisseveresinghe (Ceylon), A. A. M. Wajih (Charing Cross), F. L. Wheaton (Middlesex), and H. S. Yusef (Cairo).

Mr. G. C. Knight, F.R.C.S., of St. Bart.'s Hospital, and Dr. David Slome, of Cape Town University, were appointed Leverhulme research scholars.

London Cancer Society

At a meeting of this society, to be held at 8.30 P.M. on Friday, April 21st at the Royal Institute of Public Health, 23, Queen-square, London, W.C., Mr. C. F. Marshall, F.R.C.S., will give an address entitled a New Theory of Cancer.

Indian Medical Service Dinner

The annual dinner of the Indian Medical Service will be held at the Trocadero Restaurant, London, W., on Wednesday, June 14th, at 7.15 P.M. Air Vice-Marshal Sir David Munro has been invited to take the chair. Tickets and all particulars may be had from the joint honorary secretary, Sir Thomas Carey Evans, Hammersmith Hospital, Ducane-road, London, W.12.

Central Association for Mental Welfare

A course will be held by this association from July 1st to 22nd for persons engaged in the training of mental defectives in occupation centres. It will include lectures, classes in occupational handicrafts and rhythmic training, and also practical work. Further information may be had from the association at 24, Buckingham Palace-road, London, S.W.1.

National Association for the Prevention of Tuberculosis

The nineteenth annual conference of this association will be held at Cardiff from July 13th to 15th. The principal discussion will be on the part played in the production of tuberculosis by infection and by environment, and it will include reference to the findings of the National Association's Tyneside inquiry and to the investigation by the Welsh National Memorial Association into the high death-rate from tuberculosis in Caernarvon and Merioneth. Sir Robert Philip, chairman of the council, who will preside at the conference, will open the discussion, and Dr. Ralph Picken will follow him. A demonstration on the pathology and bacteriology of tuberculosis and an exhibition of X ray films will be given by Prof. Lyle Cummins and Dr. W. H. Tytler on the third day of the conference. There will be opportunities of visiting the various sanatoriums of the district. Further information may be had from the secretary of the association at Tavistock House North, London, W.C.1.

British College of Obstetricians and Gynæcologists

A quarterly meeting of the council was held in Birmingham on April 4th, with Dr. J. S. Fairbairn, the president, in the chair. It was decided to appoint a special treasurer who would take charge of the appeal for the endowment fund, and Mr. Comyns Berkeley was appointed to this office. The following were admitted in absentia to the membership of the College:—

Alexander Broido, South Africa; Doris Clayton Gordon, New Zealand; Reginald Francis Matters, Australia; Subodh Mitrah, India; and Stephen Alphonsus McSwiney, India.

The annual general meeting was held at Birmingham on April 5th. The president took the chair, and formally admitted to the Fellowship:—

John Hewitt, Glasgow; and John St. George Wilson, Liverpool.

and to the membership:—

Samuel Saxon Barton, Liverpool; John William H. M. Beattie, London; Jajneswar Chakraverti, India; John Cecil Dowse, Gibraltar; Richard Victor Dowse, Dublin; Wallace Freeborn, London; John Chassar Moir, London; William Charles Wallace Nixon, London; James Vincent O'Sullivan, London; Robert Watson, Liverpool; Ralph Kuper White, Southsea; and Nellie Wilkes, Derby.

The following were elected to the membership:—

Leslie Cecil Lloyd Averill, New Zealand; Keith Duff, London; William Smith O'Loughlin, Romford; and Kenneth Wilson, Brisbane.

The following were elected to the council to fill the vacancies caused by retirements in rotation and two other vacancies:—

Representatives of the Fellows:

Prof. Daniel Dougal, Manchester; Dr. T. Watts Eden, London; Prof. R. W. Johnstone, Edinburgh; Prof. C. G. Lowry, Belfast; Prof. A. Leyland Robinson, Liverpool; and Mr. T. G. Stevens, London.

Representatives of the Members:

Dr. Douglas Miller, Edinburgh; and Mr. L. Carnac Rivett, London.

The president stated that the number both of those applying for and those admitted to the membership had increased by about half during the past year. These applications and admissions were from wide areas of this country and the Dominions, which showed that the College was not merely English but British.

Queen's University Club

The London branch of this club will hold their annual dinner at the Dorchester Hotel, Park-lane, London, W., on Thursday, May 4th at 7.30 for 8.P.M. Tickets can be had from the hon. secretaries, 101, Harley-street, W.1.

Broadcasting Talks

A new series of the broadcast talks entitled a Doctor to a Mother has just begun and will continue until the end of July. With the exception of Good Friday there will be a talk every Friday at 10.45. They will include such subjects as diet, growth, exercise, homework, as well as talks on actual illnesses such as coughs and catarrhs, infectious diseases, and headaches. Different types of children will also be described, the Lonely Child, the Tired Child, and the Fidgety Child.

Fellowship of Medicine and Post-Graduate Medical Association

The arrangements for next week will be found in our Medical Diary. An all-day course in urology for advanced post-graduate students will be given at St. Peter's Hospital from May 8th to 20th. A course of two demonstrations on plastic surgery will be given at the Hammersmith Hospital: on Tuesday, April 25th, a demonstration will be given by Mr. T. Pomfret Kilner on Free Skin Grafts, and on Friday, April 28th, a demonstration by Sir Harold Gillies on Deformities of Contour and their Correction, followed by Mr. A. H. McIndoe, on the Tube Pedicle Graft and its Application. Cases will be shown at all the demonstrations. There will be a week-end course in Gynæcology at the Samaritan Hospital for Women, on Saturday, April 29th, and Sunday, April 30th, when all-day instruction will be given. An evening course in physical medicine will be given from April 24th to May 19th, at the London Clinic and Institute of Physical Medicine. An afternoon course in psychological medicine will be given at the Maudsley Hospital, Denmark-hill, S.E., from April 24th to May 31st. Further particulars may be had from the secretary of the fellowship at 1, Wimpole-street, London, W.1.

Queen's Hospital, Birmingham

At the annual meeting Sir Charles Hyde was chosen president of the hospital, after having been chosen a few weeks earlier president of the General Hospital, and this prepares the way for an amalgamation of the two hospitals, which will undertake jointly the management and administration of the new Hospitals Centre, when it is completed. The Act of Parliament required will, it is hoped, pass through all its stages by the middle of next year. It was announced at the meeting that owing to the generous legacy of Mr. Hugh Morton a superannuation scheme for nurses and hospital officers had been adopted. A further legacy had made it possible to found a Samson Gamgee prize in surgery, which will become available at the end of the year. The treasurer said that 68·6 of the in-patients were members of the local hospitals contributory association, which in the past five years collected over £1,000,000. According to the annual report there has been a great improvement in the finances, the accumulated deficit having been reduced by £7661. There were last year 5522 in-patients, an increase of 254; out-patients numbered 14,669, a considerable increase; casualty patients were 16,186. The average cost per in-patient per week was £2 19*s.* 9*d.*, and the average cost per bed for the year £156 4*s.* 8½*d.*

Vacancies

For further information refer to the advertisement columns

Ancoats Hospital Convalescent Home, Great Warford, Alderley Edge.—Hon. Visiting Phys. £50.
Aylesbury, Royal Buckinghamshire Hospital.—Res. M.O. At rate of £200.
Barking Borough.—Specialist Consultant. 50 gns.
Beckenham, Bethlem Hospital, Monks' Orchard, Eden Park.—Res. H.P. At rate of £150.
Bexhill Hospital.—Appointment to Honorary Staff.
Birmingham, City, Maternity and Child Welfare Dept.—Three Temporary M.O.'s. Each £9 10*s.* per week.
Birmingham, Little Bromwich Hospital for Infectious Diseases.—Jun. Asst. M.O. £300.
Blackburn, Queen's Park Institution and Infirmary.—Res. Jun. Asst. M.O. At rate of £150.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. and H.P. Each £100.
Bristol General Hospital.—Hon. Asst. Surgeon. Also Hon. Med. Registrar.
Bury St. Edmunds, West Suffolk General Hospital.—Sen. Res. M.O. £180.
Cardiff, Welsh National School of Medicine.—Jun. Asst. in the Surgical Unit. £450.
Charing Cross Hospital, W.C.—Hon. Anæsthetist.
Coventry and Warwickshire Hospital.—H.S. for the Aural and Ophthalmic Depts. At rate of £125.
Denbigh, North Wales Counties Mental Hospital.—Res. Jun. Asst. M.O. £350.
Derby, Derbyshire Royal Infirmary.—Ophth. H.S. and Anæsthetist. £150.
Dudley Guest Hospital.—Asst. H.S. £170.
Dundee Royal Infirmary.—Hon. Asst. Visiting Surgeon.
Eastbourne, Princess Alice Memorial Hospital.—H.S. At rate of £150.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Asst. Obstetrician.
Evelina Hospital for Sick Children, Southwark, S.E.—H.S. At rate of £120.
Glasgow Eye Infirmary.—Res. Asst. H.S. £150.
Halifax Royal Infirmary.—Third H.S. At rate of £150.
Ilford, King George Hospital.—H.S. At rate of £100.
Institute of Child Psychology, 20, Warwick-crescent, W.—Hon. Physician for Parents' Dept.
Isle of Wight County Mental Hospital, Newport.—Res. Clin. Asst. £21.
Kidderminster and District General Hospital.—H.S. £150.
Lancaster Royal Infirmary.—Sen. and Jun. H.S. At rate of £175 and £130 respectively.
Leeds General Infirmary.—Hon. Asst. Phys.
Liverpool, Hahnemann Hospital, Hope-street.—Res. M.O. At rate of £100.
Liverpool, Smithdown-road Hospital.—Res. Deputy Med. Supt.
L.C.C.—Temporary District M.O.'s. £125–£300.
London Homœopathic Hospital, Great Ormond-street and Queen-square, W.C.—Three Res. M.O.'s. Each at rate of £100.
London Jewish Hospital, Stepney-green, E.—Res. M.O. and H.P. Also Cas. O. Each at rate of £150. And H.S. At rate of £100.
London University.—Studentship in Physiology. £100.
Macclesfield General Infirmary.—Second H.S. At rate of £150.
Manchester, Baguley Sanatorium.—Sen. Asst. M.O. £500.
Manchester City.—Police Surgeon. £800.
Manchester, Monsall Hospital, Newton Heath.—First Asst. Res. M.O. £600.
Minehead and West Somerset Hospital.—Res. H.S. At rate of £150.
Newcastle-on-Tyne, Royal Victoria Infirmary.—Hon. Asst. Physician. Also Whole-time Jun. Surg. Reg. £150.
Norwich Infirmary.—Res. Asst. M.O. £480.
Princess Louise Kensington Hospital for Children, St. Quintin-avenue, N. Kensington, W.—Hon. Asst. Surgeon.
Queen's Hospital for Children, Hackney-road, E.—Refraction Officer. £1 16*s.* per Session.
Reading, Royal Berkshire Hospital.—Cas. O. £150.
Royal College of Surgeons of England.—Examiners.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.P. At rate of £100.
St. Mary's Hospital, W.—Second Asst. Pathologist. £250.
Scarborough Hospital and Dispensary.—H.S. At rate of £175.
Southampton, Royal South Hants and Southampton Hospital.—Pathologist. £800.
University College Hospital, Gower-street, W.C.—Registrar to Royal Ear Hospital. £250.
West London Hospital, Hammersmith, W.—Non.-res. House Officer. At rate of £150.
Wolverhampton Royal Hospital.—H.S. At rate of £100.
York, The Friends' Retreat.—Jun. M.O. £300.

Births, Marriages, and Deaths

BIRTHS

ABERCROMBIE.—On April 3rd, at Belsize Park, Hampstead the wife of G. F. Abercrombie, M.B., of a daughter.
BERKLEY.—On April 6th, at Liskeard, the wife of E. A. R. Berkley, M.R.C.S., of a son.
BOGGON.—On April 3rd, at Welbeck-street, W., the wife of R. Hodgson Boggon, M.S., F.R.C.S., of a daughter.
LENNANE.—On April 3rd, 1933, to Mollie, wife of G. A. Q. Lennane, of Bretby Hall Orthopædic Hospital, Nr. Burton-on-Trent—a son.
SAINT.—On April 2nd, at Duffield, Iver, Bucks, the wife of Stafford Saint, M.R.C.S., of a daughter.

MARRIAGES

MILNER—WALKER.—On April 8th, at St. James's, Sussex-gardens, Silvanus Mottram Milner, F.R.C.S., to Barbara Maud, younger daughter of the late Dr. Basil Woodd Walker and of Mrs. Walker, of Dawson-place, W.
TICKLER—CUNLIFFE.—On April 5th, at St. Andrew's, Westminster, George Mellor Tickler, M.R.C.S., eldest son of Mr. and Mrs. George Tickler, The Manor House, Bradley, Lincs, to Leigh, eldest daughter of Mr. and Mrs. Percy Cunliffe, Brookwood Corner, Ashstead, Surrey (formerly of Singapore).
WHARTON—DINGWALL.—On April 8th, at St. Stephen's Church, Prenton, John Christopher Wharton, M.R.C.S., of Banbury, son of Mr. and Mrs. Percy Wharton, Orpington, Kent, to Gertrude Margaret, daughter of Mr. and Mrs. F. W. Dingwall, of Prenton, Birkenhead.

DEATHS

FISHER.—On April 4th, at Harley House, N.W., John Herbert Fisher, M.B., F.R.C.S., Consulting Ophthalmic Surgeon, St. Thomas's Hospital and Royal London Ophthalmic Hospital, aged 65 years.
LYON.—On April 9th, at Boyndie, Barton Court-avenue, Barton-on-Sea, Hampshire, Alexander Barclay Lyon, M.D., aged 65 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

TUBERCULOUS "CHANCRES"

PRIMARY tuberculous infections are very rarely demonstrable in the adult and even the so-called post-mortem or butcher's wart is often associated with pulmonary infections. An unusual case lately described by Dr. L. Roynes,[1] of Oslo, is therefore worth summarising.

A domestic servant, aged 30, developed an indolent ulcer on the upper lip just a month after her fiancé —a sailor who was later admitted to hospital with active tuberculous laryngitis—had left her to go to sea again. About ten days before her admission to the clinic she felt ill, and two days previously to admission she developed an eruption on the thighs which spread later to the front of the legs. Clinically, there was no doubt that this was a typical example of erythema nodosum. The small lesion on the upper lip, which was the first sign noted by the patient, was no larger than a split pea, although there were two obviously enlarged and tender submandibular glands in connexion with it. Spirochætes of syphilis were absent in the scrapings from the lesion, and the Wassermann reaction remained negative throughout the time of observation. Two days after she was admitted a phlyctenular kerato-conjunctivitis (not uncommon in tuberculosis) was apparent in the right eye and the Pirquet reaction, both to human and bovine bacilli, was strongly positive. The small ulcer slowly healed but the glands softened and ultimately, in spite of several punctures, broke down. On biopsy the margin of the ulcer showed a typically tuberculous structure, and the pus from the glands contained acid-fast bacilli and caused a generalised tuberculosis in a guinea-pig. The bacilli proved to be of the human type. The patient remained afebrile and in good general condition, and neither on her admission nor on her discharge presented any evidence of a further generalisation of the infection. She was under observation in hospital for 13 months. What is chiefly remarkable in the case is the incubation period, which appears to have been about a month, and the development of erythema nodosum at a time when the patient could be regarded as passing from the anergic to the allergic stage of the infection.

Another case of probable primary infection is reported by Dr. R. Bezcecny,[2] an assistant of Prof. Kreibich at Prague. Here a girl of 13, the daughter of a man with active pulmonary tuberculosis, was brought to the clinic four weeks after the appearance of a small vesicle on the right cheek. This had been scratched and a small indolent ulcer had developed in situ; the submaxillary glands enlarged on the same side, and headache and fever developed concurrently. A dermatologist who saw the child suspected a primary syphilitic chancre but all tests were negative. The base of the ulcer showed a reddish-brown infiltration, and, on vitro-pressure, brownish nodules the size of a pin's head. A submaxillary gland was tender and obviously enlarged. Careful auscultation and radiography of the chest revealed nothing suggestive of tuberculosis. The blood count showed leucopenia and relative lymphocytosis, but became normal after excision of the ulcer. The histology of this was conclusive; it contained typical tuberculous tubercles and some 5–6 acid-fast bacilli in almost every section. A fortnight after the excision typical lupus nodules developed in the scar, and three months later these had coalesced into a patch of the disease. The glands also behaved in a characteristic manner: one of them adhered to the skin, softened, and eventually broke down; the other became fibrous and appeared to shrink under X ray treatment.

In this case the points in favour of diagnosing a primary local infection were the febrile reaction, with an ulcer infecting the regional lymph glands; the blood picture; and the absence of signs in the chest in a child who had never been ill previously. The appearance of the initial lesion was not characteristic of lupus, which differs from it furthermore in the exceeding sparsity of tubercle bacilli demonstrable. It resembled rather the Hunterian chancre, for which it was in fact mistaken, as already stated. The subsequent development of a true patch of lupus in the scar of the excision can be explained by postulating an allergic reaction in the immediate neighbourhood, and it would have been interesting to know whether during the intermediate period there was a circulatory infection with living bacilli. But both animal inoculations and cultures on the Loewenstein medium were negative, as they were in 30 cases of other tuberculous conditions of the skin under Bezcecny's observation. Of great importance, however, was the development of a positive tuberculin reaction, using the latest method devised by Nathan and Kallos. This suggests the gradual production of immunity phases developed by the epidermis as a protective measure in all cases of cutaneous tuberculosis.

[1] Dermat. Woch., 1932, xcv., 1605.
[2] Ibid., Jan. 14th, p. 45.

B.H.R.A. HANDBOOK

THE official handbook of the British Health Resorts Association, which was made the subject of a leading article last week, is published by Messrs. J. and A. Churchill at one shilling. The handbook is compiled from data supplied by medical officers of health, local authorities, and many individuals in the various resorts; and the information will be reviewed annually by a central advisory medical committee which will ensure that future issues are fully up to date, complete, and also free from commercial or undue local bias. The objects of the Association should thus, Sir Humphry Rolleston remarks in a foreword, gain the continued and cordial support of every Englishman.

Since the appearance of the handbook the medical advisory committee has been strengthened by the addition of representatives of the Royal College of Physicians of London (Dr. Rupert Waterhouse), the Royal College of Surgeons of England (Sir Holburt Waring, the president), and the Society of Medical Officers of Health (Dr. R. H. Wilshaw, M.O.H. for Worthing). It is likely that two representatives will be nominated this week by the Council of the British Medical Association.

WHAT DID NAPOLEON DIE OF?

INTEREST in Napoleon Bonaparte's last illness seems to be perennial. It should not be too difficult a matter to reinterpret in the light of modern knowledge the post-mortem records of the line, but it is not only a question of imperfect knowledge but of the desire to make the best of a case on the part of observers of different political sympathies. It was natural for the British Government of the time to support the view that their captive was enjoying the salubrious climate as far as was compatible with his position and equally natural for his own staff to make out that his illness arose entirely from the climate of St. Helena. Twenty years ago however it was generally agreed that Napoleon died from cancer of the stomach and that his physicians were to blame for failing to make even an approximate diagnosis of his condition during life. But in a lecture delivered before the Hunterian Society in January, 1913, Sir Arthur Keith made out a case for his view that, while Napoleon suffered from a cancer of the stomach at the time of his death, there was good evidence to show that he was also the subject of a second disease—namely, an endemic fever, causing symptoms of inflammation of the liver, similar in its nature and effects to a chronic form of undulant fever. These symptoms, he suggested,

masked those of cancer and misled Napoleon's physicians just as they would mislead the majority of physicians to-day. In a learned thesis published in the same year Dr. Arnold Chaplin argued that contemporaneous reports could not be relied on implicity and that the real opinions of the medical men must be sought in their uncensored daily notes, which he found in the Lowe Papers deposited in the British Museum. According to these the post-mortem examination clearly showed an extensive malignant growth of the stomach, probably starting from a previously existing chronic ulcer. In the report of appearances on the dissection of the body of Napoleon Bonaparte, reprinted in *John Bull* (Oct. 13th, 1822), we read: "The internal surface of the stomach, to nearly its whole extent, was a mass of cancerous disease or scirrhous portions advancing to cancer. This was particularly noticed near the pylorus.. Strong adhesions connected the superior surface, particularly about the pyloric extremity, to the concave surface of the left lobe of the liver and, on separating these, an ulcer which penetrated the coats of the stomach was discovered, one inch from the pylorus, sufficient to allow the passage of the little finger."

Now Prof. Tauno Kalima has been going over the evidence once more (*Acta Chir. Scand.*, 1932, lxxii). In the autumn of 1923 he happened to read "La Captivité et la Mort de Napoléon," published in 1921 by Paul Aretz, and this coincided with certain studies he was making on the pathological anatomy of the stomach. The records of the medical men who had attended Napoleon during his last illness came to Kalima as a great surprise; for here he found the characteristic clinical and pathological picture, not of cancer, but of ulcer of the stomach—a condition whose nature was not understood by medical science in Napoleon's time. It was not till 1829 that Cruveilhier published his first paper in which he described ulceration of the stomach as a disease distinct from cancer of the stomach. Napoleon himself suspected cancer; his father and his two sisters were supposed to have died of cancer of the stomach, and this familial factor was accepted as collateral evidence in favour of the diagnosis of cancer in the Emperor himself. It is commonly assumed that as early as the battle of Waterloo Napoleon had begun to suffer from the disease from which he ultimately died. But Prof. Kalima puts the appearance of the first symptoms as late as the end of September, 1817, when Napoleon felt a dull pain in the region below the right costal arch. Next day he complained of similar pain to Dr. O'Meara, who notified Sir Hudson Lowe, adding that if other symptoms supervened there would be reason for fearing disease of the liver. Napoleon died on May 5th, 1821, his disease having lasted about three and a half years. It was characterised throughout its course by the typical clinical picture of gastric ulcer, with periodic attacks of dyspepsia, increasing anæmia doubtless due to occult hæmorrhage, and marked irritability of the stomach betrayed by daily attacks of vomiting and severe pain. The immediate cause of death was a profuse gastric hæmorrhage. He lost much weight during the last few months but he was never jaundiced, and the necropsy failed to show any malignant secondary deposits. The post-mortem report on the condition of the stomach must to-day, says Prof. Kalima, be regarded as a text-book description of chronic non-malignant ulceration of the stomach.

The same view of Napoleon's last illness has been brought out by a discovery of the memoirs in two volumes of Dr. Walter Henry, an assistant staff surgeon to the British Garrison at St. Helena during Napoleon's imprisonment. Mr. George A. Kingston, who has published a note about it in a Canadian medical journal, tells us that Dr. Henry was present at the autopsy and writes of what he actually saw. Dr. O'Meara had diagnosed the liver as the faulty organ, and this was also the view of Dr. Antommarchi, although Napoleon himself referred the mischief to his stomach. In this, to quote Dr. Henry's words, "he was perfectly right, as the event proved. This organ was found most extensively disorganised; in fact it was ulcerated all over like a honeycomb. The focus of the disease was exactly the spot pointed out by Napoleon—the pylorus, or lower end, where the intestines begin. At this place I put my finger into a hole made by an ulcer that had eaten through the stomach, but which was stopped by a slight adhesion of the adjacent liver. After all, the liver was found free from disease, and every organ sound except the stomach." Antommarchi, Dr. Henry states, was about to put his name to such a bulletin when he was dissuaded from doing so by the French officers present as it would contradict the diagnosis of Dr. O'Meara. Dr. Henry went on to assert that there was in St. Helena no such disease as the gastro-hepatitis from which it was stated that Napoleon died.

AMBULANCES AND FIRST-AID

A STEADY increase of work is reported by the Home Service Ambulance Committee of the Joint Council of the Order of St. John and the British Red Cross Society.[1] There are now 319 stations, and the committee is satisfied that its work thoroughly justifies the heavy expenditure which the inauguration of the service involved. Since the service was set up 1,186,448 cases have been carried in ambulances, and first-aid has been rendered in innumerable instances in addition.

The committee claims that unskilled handling of accident cases before they reach the doctor has now become a subject for the gravest censure, and that few patients now suffer from inadequate transport or ill-applied zeal. The greatly increased scope of hospital service since the late war, and the increasing number of people who go to nursing-homes instead of being nursed at home, calls for very much more transport than was needed in the past. Invalid transport work has played an increasing part in the activities of first-aid units, and the committee hopes soon to establish a private motor-car service for patients who are not strictly ambulance cases. Work of this kind is already carried out in several districts through the generosity of private car owners. The road service scheme, for bringing first-aid as quickly as possible to those injured in road accidents, has made remarkable progress, and there is at present unfortunately no indication of any decrease in the need for its service. The work involves much trouble and inconvenience to those who carry it out, but they give their services gladly partly in the spirit of charity and partly in that of the skilled craftsman giving practical effect to the ability he has laboriously acquired. The mobile X ray unit is also rendering valuable service to doctors who require an X ray examination of patients in the home. The committee insists that the patient shall remain under the supervision of a competent radiologist.

GROUP TALKS ON SEX TO SCHOOLS

EARLY in the year 1927 the Welsh National Council of the Alliance of Honour drew up a scheme by which the views of parents could be ascertained on the advisability of giving sex education in schools attended by their children. A sufficiently large majority of the parents, feeling themselves unequal to the task of imparting the necessary information, approved of the assumption of this responsibility by the schools.

The teachers consulted—or 96 per cent. of them—thought it preferable that the subject be dealt with, not by the ordinary staff, but by an outside person who is here described as a "peripatetic specialist" in the teaching of sex hygiene. This book,[2] which records the experiences of the specialised teachers selected, is divided into three parts. The first part contains an apologia for the group method of instruction

[1] 14th Annual Report. 1933. Pp. 13. Joint Council House, 12, Grosvenor-crescent, S.W.1.
[2] Sex Education in Schools. By Theodore F. Tucker and Muriel Pout, B.Sc., M.I.H. London: Gerald Howe, Ltd. 1933. Pp. 144. 3s. 6d.

which the authors have adopted, and advances evidence that most children of school-leaving age have distorted views about the phenomena of pregnancy, childbirth and menstruation. The confusion of ideas which prevails is well illustrated by a list of questions that have been asked by children after the authors' talks. In the second part the authors give textually their specimen lessons, a notable feature of which is that contact is established with the class and embarrassment dissipated by humorous touches and homely references to the daily lives of the children. The subjects of human gestation and parturition are unambiguously described in different language for the two sexes, and the subject of masturbation is introduced into a simple outline of sex hygiene. Reference is made in the talks for boys to nocturnal emissions, and in those for girls to menstruation. The authors avoid the all too common tendency to describe at length the pollenation of plants and the fertilisation of lower vertebrates, and then to stop short after they have raised and left unanswered the obviously relevant questions about human beings which would occur to the child.

In the third part are set forth the results of 144 questionnaires upon the authors' methods which were filled in by the school teachers in whose presence the talks were delivered. These questionnaires show that, in the opinion of a very large majority of the teachers, the talks were received by the children without embarrassment, met one of their real needs, and provoked reactions which were regarded as healthy. A large majority also favour the extension of the talks to the elementary schools, approve of the friendly and amusing style of exposition, and are of the opinion that the talks come better from outside specialists than from the routine class teachers.

As judged by this searching test, therefore, the method of group teaching described in this book has proved a highly successful experiment. The criticism to which the talks are most exposed is that they omit reference to the function of coition, about which questions will inevitably be provoked in the child's mind. This omission is acknowledged and, according to the authors, is attributable to limitations of time and not to other causes. The book has the advantage that its authors, unlike many of those who write on sex education, write as the result of experiences in teaching their subject, which are susceptible to statistical treatment.

RAW APPLE FOR DIARRHŒA IN CHILDREN

IN Germany a diet of raw apples has long been popular in the treatment of diarrhœal conditions in childhood, and of late years it has had medical recognition. Prof. E. Moro,[1] of Heidelberg, in 1929, reported favourable results in the treatment of 52 children between the ages of 3 months and 10 years who were suffering from various diarrhœal conditions. He attributed the success of the treatment largely to the tannin-containing principle of the apple, which he held had a protective action on the cells lining the gastro-intestinal tract, and also to the absorbent and mechanical action of the apple pulp passing through the gut. In America, Dr. T. L. Birnberg[2] has just reported equally favourably of the method, which he has used in 70 cases of diarrhœa in children between the ages of 9 months and 11½ years; 50 of these were treated in the home or as out-patients; 26 of the patients were infants under two years old. The diet consisted solely of raw scraped apple, completely ripe fruit being used. One to four tablespoonfuls or more of the pulped or grated apple were given every 1 to 2 hours for 24 hours, the amount varying with the size of the child. Sugar was added if necessary, and if the patient was thirsty small amounts of weak tea without milk were given. In some cases the addition of banana pulp was found to make the apple more palatable. After 48 hours of this treatment a transitional diet containing no milk or vegetable, and including cooked cereal, toast, and cocoa was given for a further 48 hours, and a gradual return to a normal diet then made. Birnberg recommends that the treatment should be begun as soon as possible after the onset of symptoms, but concludes from his own cases that there is no relation between the results obtained and the time at which it is instituted. There was a favourable reaction to treatment in 88 per cent. of the cases, while some at least of the failures were attributable to lack of coöperation on the part of the patient or the mother. Abdominal pain, which was an almost constant symptom in the older children, disappeared rapidly in most cases and was never increased. Thirty-eight of the patients had enteritis, and in all of these the temperature was somewhat elevated at the onset of treatment; 33 of these were afebrile within 96 hours. The average number of stools in the cases of enteritis for the 24-hour period preceding treatment was 12, which fell (in 37 of the 38) to an average of 4 for the first 24-hour period on the diet. The character of the stools showed a rapid improvement in the majority of cases, formed stools appearing on an average in 24 hours. Birnberg points out that the treatmnt not only succeeds in relieving symptoms, but has the additional merit that it maintains the nutritional requirements of the child during the period of treatment, and prevents serious loss of fluid.

[1] Klin. Woch., 1929, viii., 2414; see THE LANCET, 1930, i., 526. [2] Amer. Jour. Dis. Child., Jan., 1933, p. 18.

INSTRUCTIONS FOR DIABETIC PATIENTS

A LITTLE book containing simple instructions for diabetic patients has recently been issued by the physician in charge of the Royal Free Hospital Diabetic Clinic.[1] It is intended primarily for patients attending this clinic, and will help to guide them through difficulties arising in the diet and insulin control of their disease after the usual routine has been established by the physician in charge. The testing of 24-hour collections of urine, as here advised, is not so helpful as the testing of isolated samples over shorter periods; and the recommendation that a solution of table (cane) sugar should be given by the rectum in severe hypoglycæmia should be altered in a future edition since cane sugar is not absorbed in this way. Instructions about insulin injections and the control of illness leading to dangerous ketosis are clear and sound.

PRISON FOR SELLING RAW MILK

THE Bureau of Dairy Products in Chicago is charged with the responsibility of enforcing the ordinances and provisions of the City's sanitary code in such a way as to secure for Chicago an adequate supply of pure, safe, and wholesome milk. The Bureau has insisted on the reconstruction of many new milk plants in the past year; anyone receiving, pasteurising, or processing milk for sale must possess a permit from the Board of Health to obtain which it is necessary to give an assurance that only milk of good quality from approved sources is accepted. Nevertheless constant diligence is required to protect unsuspecting citizens from the sale of questionable milk derived from uninspected and untested sources. An example of this vigilance is given in the annual report for 1932 in these words: "a number of persons who, under economic duress, had conceived the idea of procuring milk from unapproved farms and perhaps from diseased cattle were arrested in order to secure the immediate discontinuance of the practice." It is not stated under what powers these arrests were made.

[1] Simple Instructions for Diabetic Patients. By Dorothy C. Hare, M.D., M.R.C.P., Physician to Royal Free Hospital. London: H. K. Lewis and Co., Ltd. 1933. Pp. 20. 1s.

A CURE FOR COLDS.—The Liverpool University Settlement Blood Transfusion Service is so short of volunteers that hospitals have been warned of a temporary suspension of the service. An official appeal for volunteers runs: "Give away some of your blood. It cures colds, prevents boils and helps you to keep fit."